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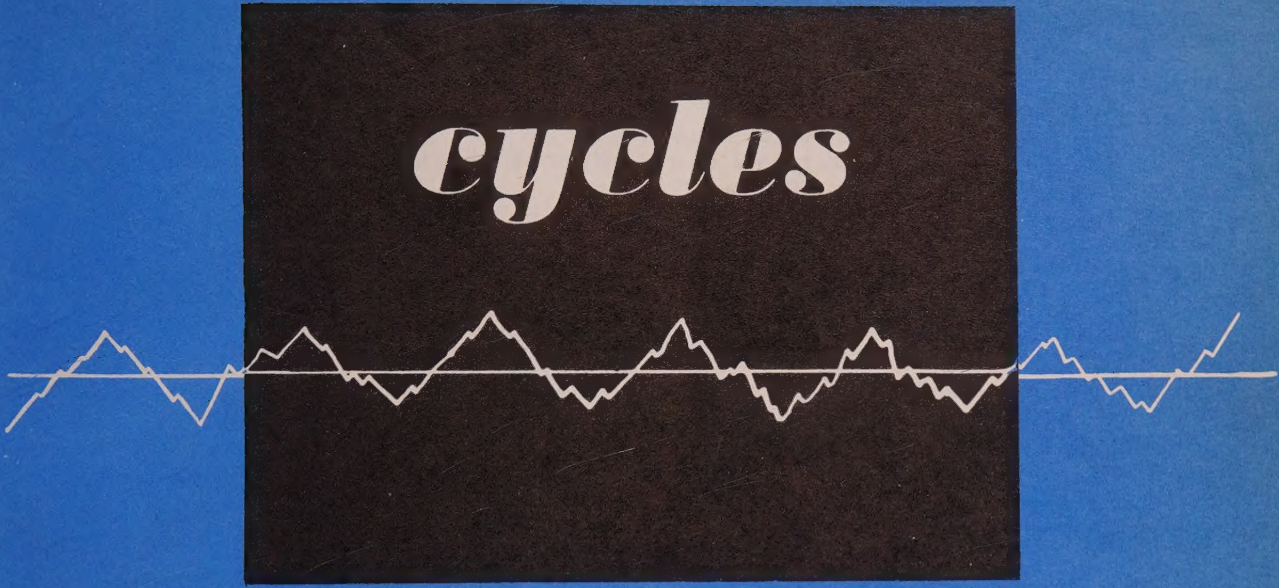

January 1955

FOUNDATION FOR THE STUDY OF CYCLES
New York, New York

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cycles

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VOLUME VI NUMBER I JANUARY 1955

The Director's Letter

Dear Member:

War!

There are two kinds of war. Civil war, where peoples fight among themselves; international war, where nation fights nation.

When there is much international war, civil war generally slacks off; and vice versa.

I do not know why this is so. Perhaps, when there is international war, people do not have time or energy for civil conflict. Perhaps, when there is international peace, we have a chance to exercise our natural cussedness by brother fighting brother. No one knows.

From your standpoint, international war is the more important. Also, I know more about it. For these two reasons these remarks will be limited to international war.

"War" is hard to measure. It is better to speak of "battles." Even this word is a bit vague. But it is better than the word *war*. I shall speak of battles hereafter. International battles.

There are cycles in the number of international battles. That is, sometimes there are many battles; sometimes not very many. Right now there are very few. The world is not likely to be so peaceful again for many, many years.

The times when there are lots of international battles tend to come at reasonably regular time intervals. The man in the street says, "Wars come about once in a generation." By "wars" he means lots of international battles. By "once in a generation" he means once in about 20 years. Science confirms the man in the street. We do have lots of international battles once in about 20 or 22 years.

The man in the street goes on to say, "This is so because it takes about that long to forget the horrors of war; to raise a new crop of soldiers." Science does *not* confirm the guesses of the man in the street in regard to the *causes* of the regular cycle of war. They seem to be more complex than the man in the street imagines. It is often so.

It is much easier to prove that the man in the street is wrong than to explain what is right. It is almost always like this. It is easy to say that Santa Claus does *not* come down the chimney. It is hard to explain how he *does* enter through the heart.

I have come to believe that war, like Santa Claus, comes to us through the heart. That is, that wars are primarily matters of *feeling*. Not only the feeling in the other fellow's heart, but the feeling in your heart and mine as well.

Study of the ebb and flow of the number of international battles year by year for the past 2500 years. You too will become convinced that the regularity of the ups and downs cannot reasonably be random.

If not random forces, then what forces could have caused the dramatic regularity?

The answer is obvious: Only some environmental force acting upon people in the mass.

What is this force? Where does it come from? How does it operate? What, if anything, can be done about it? I will answer you.

What is this force? No one knows yet. We have to learn things gradually. There was a time when no one knew why the lodestone always pointed north. However, the fact that it always did gave people the right to assume that *something* made it do so. We have the same right when we see the great regularity of war patterns throughout recorded history.

Where does this force originate? Almost certainly outside the earth. Regular cycles of the same wave length are present on the sun.

Does this mean that the sun is the source of this force? Not necessarily. Perhaps the corresponding cycles we find on the sun may, on their part, be merely a result of cosmic forces external to both the sun and ourselves.

Isn't this idea rather fantastic? Yes. But as Confucius says, that not prove anything, one way or the other.

How do these forces operate? Again, no one knows. However, I think it safe to say that those people who have responded to them have stood a better chance of survival than those who have not. I do not know why this is so. Perhaps those people who responded more easily to the war forces tend to conquer and exterminate their neighbors. Perhaps those people who fight their neighbors only once in a while—instead of all the time—stand a better chance of victory and hence of survival. However, it may have been, we may be sure it was good—for the victor!

What can we do about it? Several things.

First, we can use our new-found knowledge to time, with reasonable accuracy, the next peak in the number of international battles. (See page 29, the Postscript to Chapter XII.) We *can*, but, as a nation, *will* we?

Second, we can use our knowledge of timing to prepare ourselves for what is ahead. We *can*, but, as a nation, *will* we?

Third, we can thus win any conflict in which we become involved. We *can*—but *will* we?

Faithfully yours,

Edward R. Dewey

Director

Typographical Error In The December 1954 Report

As a result of an error at the printer's, the months were omitted (blocked out) from the table on page 349. This table gave the percentages that the three automobile cycles combined are of the 41-year moving average trend. It should have read:

July 1954	95% of trend.	Jan. 1956	88% of trend.
March 1955	108% of trend.	March 1956	85% of trend.
Nov. 1955	85% of trend.	March 1957	118% of trend.

Research

ARE CYCLE LENGTHS RELATED?

HAVE you noticed that when you have a well established cycle you often find another cycle 2 or 3 times as long? Or one which is one half or one third as long? Or is some multiple or some fraction involving 2's and/or 3's in combination?

Is this just happenstance? I do not know; but the idea of systematic relationships of this sort certainly seem to be worth investigating.

To show you a little more clearly just what I am talking about, let me first take for manipulation a number like 60. Sixty is easy to multiply and to divide in your head.

For our example we want to multiply and divide 60 in all possible ways involving 2 and 3.

To get all possible multiples of 60 involving 2 and 3, you would multiply 60 by 2 to get 120; and by 3 to get 180.

Then you would multiply 120 by 2 to get 240; by 3 to get 360. You would also multiply 180 by 3 to get 540. (You would not bother to multiply 180 by 2 to get 360 because you already got that number by multiplying 120 by 3.)

Then multiply 240, 360, and 540 each by 2 and by 3.

You could continue this process as far as you wished.

Similarly you could divide 60 by 2 to get 30; by 3 to get 20.

You could then divide 30 by 2 to get 15; by 3 to get 10. You could divide 20 by 3 to get 6 2/3.

You could continue this process also as far as you liked.

Table 1 shows the results of your work.

Now suppose you were to make similar computations for some well established cycle. This would give you a series of theoretical wave lengths. If you made these computations you could then compare the theoretical wave length with actual known wave lengths. In this way you could see if there were real wave lengths to correspond to the theoretical wave lengths. If so, it would suggest that the theory might be right.

For our experiment I am going to take the well known 17.75 year cycle. We do not know the *exact* length of this cycle but it seems to be within about 1% of 17.75 years long. We will take the length as being 17.75 years, understanding that if the true length is a shade more or less, all the multiples and fractions will become a shade more or less to correspond.

The calculations are shown in Table 2. For reference the lengths are numbered (in descending order of size). The lengths for which you can find cycles of more or less corresponding wave lengths are printed in boldface type.

Let us now search our memories and the indexes of the last five volumes of *Cycles*. This will show us the extent to which various observed cycles do or do not fit into this outline.

Of course some of these observed cycles may not have been measured just exactly right. More exact measurement might make them fit, in those cases where they do not quite fit now.

This works the other way too! Cycles which now seem to fit the scheme might not fit, when they are measured more exactly.

Anyway, for what it may be worth, the observed cycles which are close to the theoretical lengths of our scheme are given below in Table 3.

TABLE 1

Multiples and Fractions of the Number 60

etc. etc. etc.

480 (60×2×2×2)   720 (60×2×2×3)   1080 (60×2×3×3)   1620 (60×3×3×3)

240 (60×2×2)   360 (60×2×3)   540 (60×3×3)

120 (60×2)   180 (60×3)

60 (THE NUMBER)

30 (60÷2)   20 (60÷3)

15 (60÷2,÷2)   10 (60÷2,÷3)   6 2/3 (60÷3 ÷3)

7 1/2 (60÷2,÷2,÷2)   5 (60÷2,÷2,÷3)   3 1/3 (60÷2,÷3,÷3)   2 2/9 (60÷3,÷3,÷3)

etc. etc. etc.

TABLE 2

Multiples and Fractions of 17.75 years

142.0 yr. (5)   213.0 yr. (3)   319.5 yr. (2)   479.3 yr. (1)

71.0 yr. (7)   106.5 yr. (6)   159.8 yr. (4)

35.5 yr. (9)   53.3 yr. (8)

17.75 yr. (10)

8.88 yr. (11)   5.92 yr. (12)

4.44 yr. (13)   2.96 yr. (14)   1.97 yr. (16)

2.22 yr. (15)   1.48 yr. (17)   .99 yr. (19)   .66 yr. (21)

1.11 yr. (18)   .74 yr. (20)   .49 yr. (22)   .33 yr. (23)   .22 yr. (24)

TABLE 3

Theoretical Cycle Lengths
(multiples and fractions of 17 3/4 years)
and observed cycles which more or less correspond.

Theoretical Cycle	Found In —	Observed Length
(1) 479.3 yrs.	Not yet found	--
(2) 319.5 yrs.	Not yet found	--
(3) 213.0 yrs.	Not yet found	--
(4) 159.8 yrs.	Pig Iron Prices	159 yrs.
(5) 142.0 yrs.	Number of International Battles	142 yrs.
(6) 106.5 yrs.	Women's Fashions	105 yrs.
(7) 71.0 yrs.	Not yet found	--
(8) 53.3 yrs.	British Wheat Prices	54 yrs.
	Arizona Tree Rings	54 yrs.
	Railroad Stock Prices	54.6 yrs.
(9) 35.5 yrs.	Abundance of Lynx in Canada	35.2 yrs.
	Frequency of Aurora	35.9 yrs.
	Frequency of Earthquakes in China	35.2 yrs.
	European Weather	35.5 yrs.
	Barometric Pressure of Batavia	36 yrs.
	Manufacturing Production	36 yrs.
	Wheat Prices in Western Europe	36 yrs.
(10) 17.75 yrs.	Liabilities of Commercial and Industrial Failure	17 3/4 yrs.
	Cotton Prices	17 3/4 yrs.
	Tree Ring Widths	17 3/4 yrs.
	Pig Iron Prices	17 3/4 yrs.
	Sunspots with Alternate Cycles reversed	17 3/4 yrs.
	Industrial Stock Prices	17 3/4 yrs.
(11) 8.875 yrs.	Pig Iron Prices	8.9 yrs.
	Widths of pre-glacial tree rings	8.85 yrs.
(12) 5.916 yrs.	Cotton Prices	5.91 yrs.
	Pig Iron Prices	5.91 yrs.
	Copper Prices	5.91 yrs.
	Sunspots with alternate cycles reversed	5.91 yrs.
	Tree ring widths	5.91 yrs.
	Railroad Stock Prices	5.9 yrs.
	Industrial Stock Prices	5.93 yrs.
	Dozens of other series of figures	about 6 yrs.
	Wheat Prices in Western Europe	5.96 yrs.

		One half of the time it takes the planet Jupiter to go around the sun	5.931 yrs.
		One fifth of the time it takes the planet Saturn to go around the sun	5.892 yrs.
		One forty-second of the time it takes the planet Pluto to go around the sun	5.915 yrs.
(13)	4.438 yrs.	Sales of Company G	4.37 yrs.
	(53.25 months)	Industrial Common Stock Prices	4.4 yrs.
		Railroad Stock Prices	4.4 yrs.
		Pig Iron Prices	4.44 yrs.
		Advertising Effectiveness of Pinkham Medicine Company	4.41 yrs.
		European Wheat Prices	4.41 yrs.
(14)	2.958 yrs.	Factory Sales of Passenger Autos	36.0 mos.
	(35.5 months)	Common Stock Prices	35.6 mos.
			36.2 mos.
(15)	2.219 yrs.	Not yet found	--
	(26.625 months)		
(16)	1.97 yrs.	Factory Sales of Automobiles	23.6 mos.
	(23.6 months)	Industrial Stock Prices	23.7 mos.
		" " "	23.2 mos.
(17)	1.48 yrs.	Industrial Stock Prices	17.3 mos.
	(17.75 months)	" " "	17.8 mos.
(18)	1.11 yrs.	Industrial Stock Prices	13.1 mos.
	(13.31 months)	" " "	13.2 mos.
		" " "	13.3 mos.
		" " "	13.6 mos.
(19)	.99 yrs.	Industrial Stock Prices	11.9 mos.
	(11.83 months)	" " "	12.0 mos.
		" " "	12.1 mos.
(20)	.74 yrs.	Sales of Company G	8.8 mos.
	(8.88 months)		
(21)	.66 yrs.	Sales of Company G	7.92 mos.
	(7.89 months)		
(22)	.49 yrs.	Electric Potential of Trees	6. mos.
	(5.92 months)	Industrial Stock Prices	5.9 mos.
(23)	.33 yrs.	Electric Potential of Trees	4. mos.
	(3.94 months)	Sales of Company G	4.05 mos.
(24)	.22 yrs.	Not yet found	--
	(2.63 months)		

(In addition, a cycle about 2.97 months long, found in common stock prices, fits into the scheme.)

The gaps in Table 3 are not particularly significant. For the most part the series of figures we have available are so short that the identification of cycles over 70 years in length is well nigh impossible.

On the other hand, the fact that a number of the discovered cycles do seem to fit into the pattern may of course be merely a matter of coincidence. Remember that cycles of many wave lengths have been observed. Some could doubtless be found to fit into any scheme.

To test the idea we need a comprehensive research program. Such a program would do three things:

1. It would investigate various series of figures for cycles of the missing wave lengths. 2. It would re-examine and remeasure with greater exactness the cycles that seem to fit into the idea in order to see whether or not they really do fit. 3. It would see if other well known cycles could be arranged into families, also.

Conclusions

I find the above possibilities provocative. I feel that they definitely call for further research along the lines indicated to see whether or not there really are families of cycles. If there are, we should learn more about them. For example we should learn their exact base wave lengths. We should learn whether or not they have "cousins" related by 5's, 7's, etc. as well as the "brothers" and "sisters" listed above related by 2's and 3's. If there are families of cycles, I would hope that in time we could discover their cause.

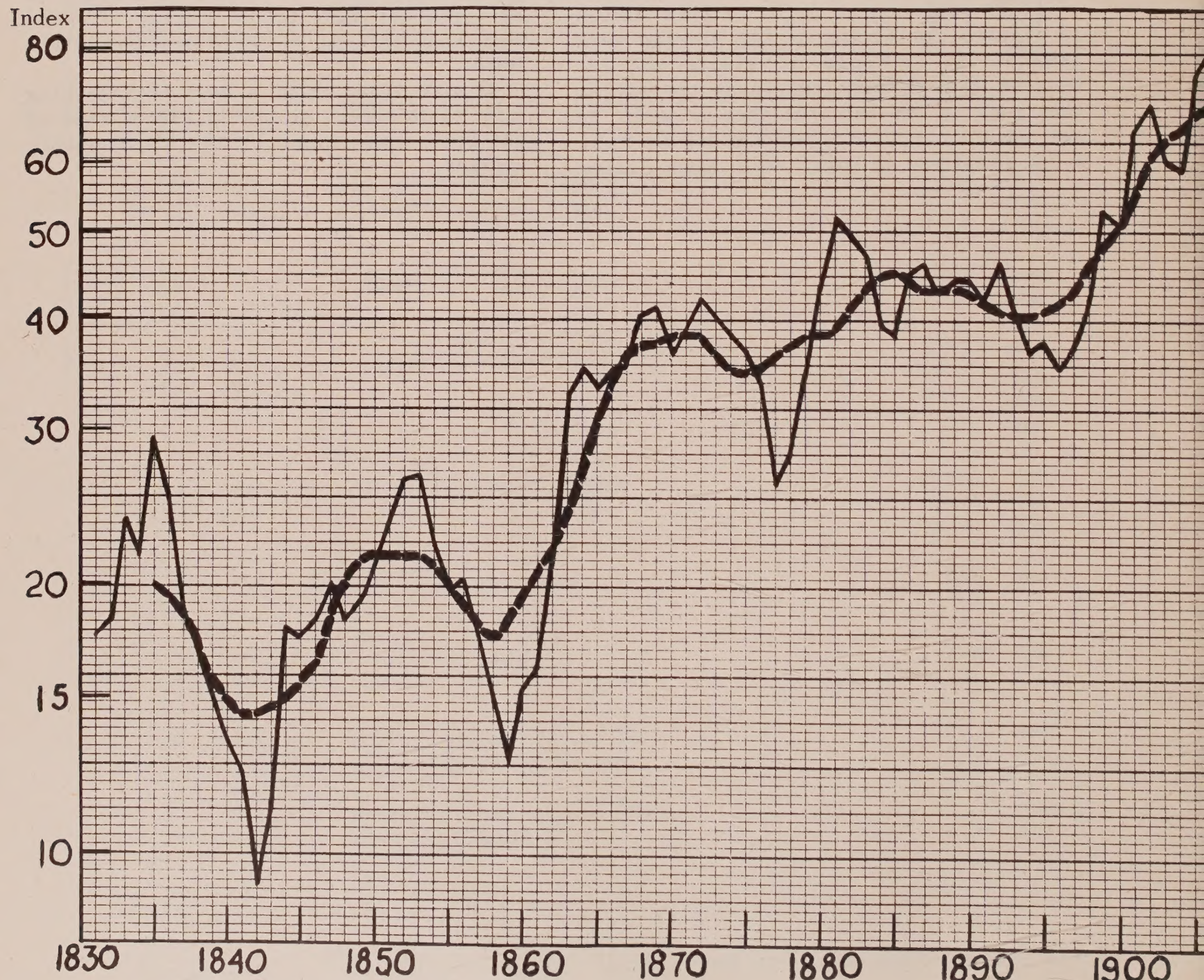
I wish I had about a year with nothing else to do except to try to answer some of the questions raised by the above observations.

THE LONG CYCLE IN STOCK PRICES

THE heavy broken line in the chart below shows you the long cycle in stock prices. There have been six waves of this cycle in these figures since 1831, when the figures begin.

Obviously the present long cycle is reaching for a top. Just exactly when will it come? That depends on how long, on the average, the long cycle really is, It also depends on the variations we may expect from wave to wave.

Because of the strong upward trend of stock prices since 1831 you cannot time the long cycle too well unless you correct for trend. When you do this you find that the wave lengths seem to measure about as follows: 17¾, 17¾, 17¾, 21, 21½, and for the present cycle, at least 21½



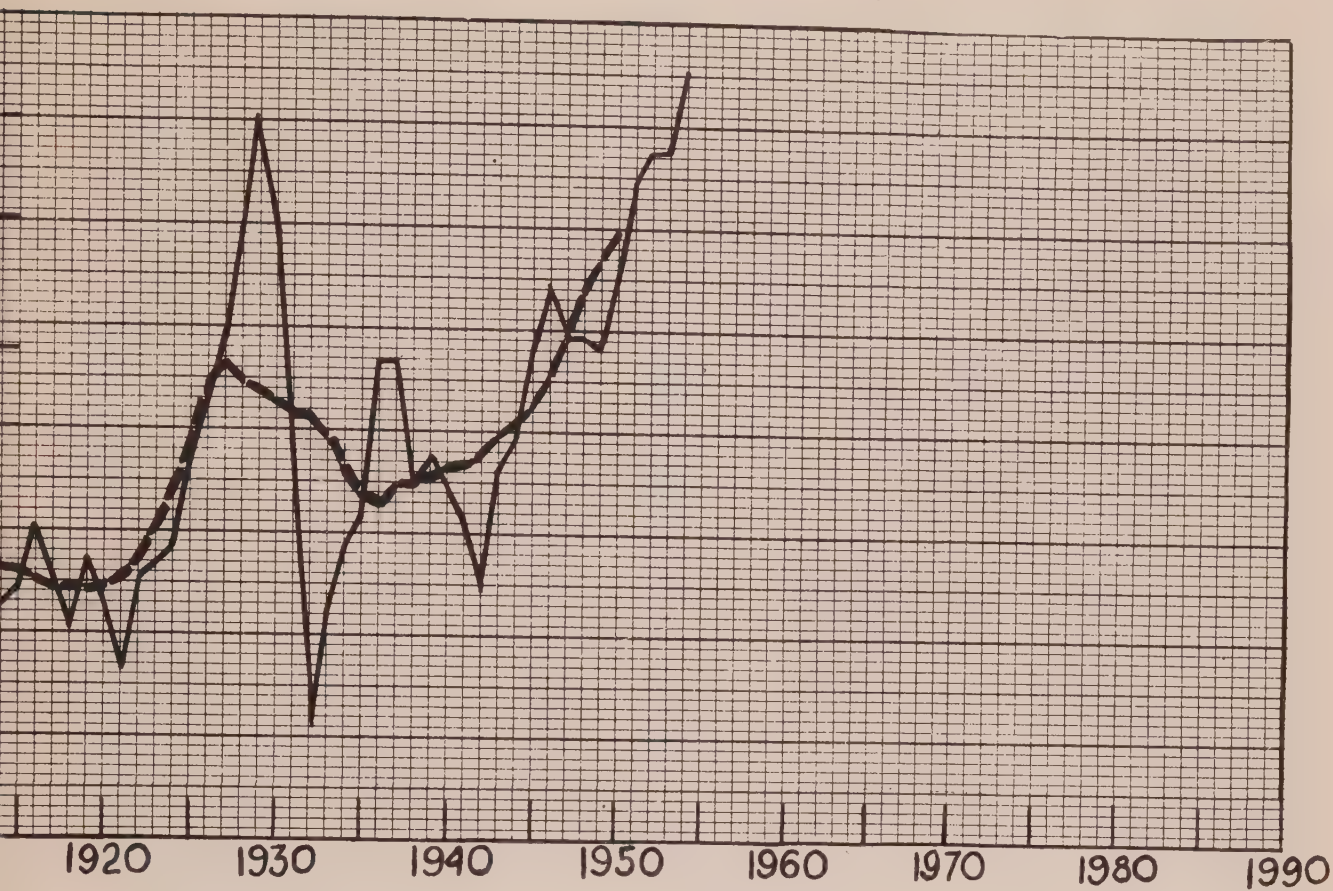


Fig. 1. The Standard and Poor's Combined Index 1871--1954 Extended Backward to 1831. Broken line shows long cycle. Ratio Scale.

years.

The behavior needs more study, but on the face of it suggests a 17¾-year cycle which has been gradually overwhelmed by a 21, 22, or 23-year cycle. (What is left of the 17¾-year cycle could make a 23-year cycle look a bit shorter for a wave or two.)

This change of wave length could be the result of the changing nature of the index. In the early days the index was wholly made up of railroad stocks. Along about 1880 industrials and utilities began to be added.

From the standpoint of the present market situation there are three important matters: One, are these long cycles regular enough to suggest that they are the result of some rhythmic force which can be expected to continue? Two, if so, what is the true length of this long cycle? (Only by knowing its true length--if it has one--can you know when it is going to turn down.) Three, what would be the effect upon today's market if we had a downturn in the long cycle of stock market prices? I shall answer these questions as best I can in future reports.

In the meantime however it can be stated (1) I believe that the regularity does have significance. (2) I do not know the wave length, but it could be as long as the well known 23.7-year cycle. (3) If so, a preliminary fitting of such a length suggests a crest of the long cycle due ideally at about the present time. (4) The implications of all of this are, from the standpoint of the long term investor, that now may be a time for caution.

E.R.D.

THE 14 2/3-YEAR CYCLE IN THE NUMBER OF STRIKES IN THE UNITED STATES

EARLY in 1950 I called your attention to a 14 2/3-year cycle which has been present in the number of strikes and lockouts in the United States from 1880 up through 1949. I showed you by means of a chart; first, that there had been a steadily upward trend of strikes and lockouts and second, that the 14 2/3-year cycle indicated a greater than average number of strikes in the period 1943--1951 and a smaller than average number of strikes in the period 1951--1958.

I reprinted this chart for you showing you how these figures had unfolded for 1950 and 1951.

We now have figures for 1952 and 1953 and an estimate for 1954. These additional figures are also charted on the following page.

It is too soon to know whether or not these figures are working out in accordance with expectations.

If the cycle continues, we are due to have—relative to trend—a less than usual number of strikes and lockouts in the United States between now and 1958, to be followed by a more than usual number of strikes and lockouts from 1958 to 1965.

The reasons pro and con for believing in the validity of this cycle were given in the report for November 1952 and are reprinted below.

There are four reasons for questioning the significance of the cycle.

First of all, four and a half repetitions of a rhythmic cycle can easily come about as a result of random forces.

Second, there was a wave of strikes during and after World War I and another wave during and after World War II, just 29 years or two 14 2/3-year cycles later. Thus, two of the peaks upon which one must depend for one's notion of a 14 2/3-year wave were "war" peaks and may have been caused—at least in part—by a factor that had nothing to do with a 14 2/3-year cyclic force. The two or three remaining peaks may have just happened to fall into the major pattern set by the wars.

(On the other hand, there could be an error in the popular assumption that the strike peaks of 1917 and 1946 were war induced. These waves were no greater (relative to trend) than the wave of 1903 or the wave of '86--'90 when there was no war. Perhaps the wars just happened to fit into the cycle. Until we know more about cycles, no one will know, but a reasonable guess might be, if there is a 14 2/3-year cycle in the number of strikes, that the behaviors of 1916--20 and 1944--46 were partly the result of war and partly the result of cyclic forces.)

A fourth reason for not being too sure about a 14 2/3-year rhythm in the number of strikes is the fact that the low due in 1925 and the high due in 1932 were both much delayed. However it must be admitted that after the distortion the pattern snapped back into phase, as it always does when the wave is real.

On the other hand, note that there is a rhythm of about this length in a number of other phenomena. For example, Professor Pearson, of Cornell, has found a rhythm of about this length in pepper prices since 1860, and in the purchasing power of beef cattle from 1880, Anderson of the Bell Telephone laboratories finds an average wave of about this length in sunspots with alternate cycles reversed from 1749, Clayton finds it in sunspots, and it has been found in other time series as well. I have found a similar average wave in tree rings over very long periods of time.

Measurements have not yet been made with sufficient accuracy so that you can be sure that the average lengths of the cycles in these various time series are identical, but the possibility is intriguing.

It is also worth noting that the time of the turning points is much the same, insofar as these times are known. For example, Anderson tells me that this wave in the sunspot series had an ideal top in 1901; the wave in the purchasing power of beef cattle had an ideal top in 1901; in black pepper prices in 1902; in strikes in 1903. (The date of the top of the average wave in tree ring widths is not known to me.) Such coincidence of timing is noteworthy, and adds importantly to the idea that we may be dealing here with something significant.

The figures are so irregular that it is a little difficult to know just what the trend may be, but at a guess it was about 4,500 in 1953 and increasing at the rate of about 51.5 per year. Anything under this can be considered as below trend. Anything above it as above trend.

All Hail Discord and Economic Waste!

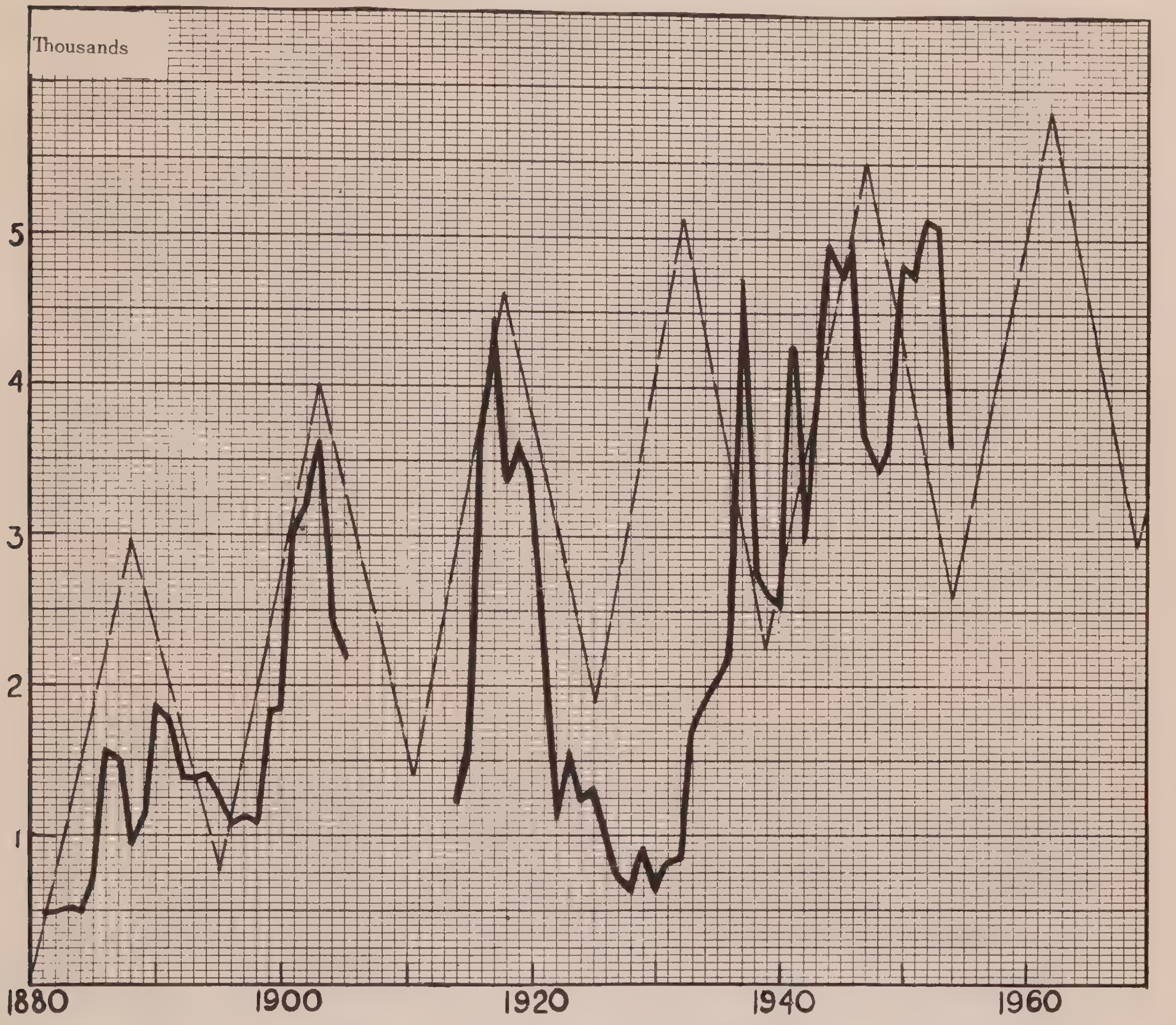


CHART SHOWING THE NUMBER OF STRIKES AND LOCK—OUTS IN THE UNITED STATES, 1881—1954

A 14 2/3-YEAR CYCLE HAS BEEN ADDED BY MEANS OF A DOTTED LINE
THERE IS NO ASSURANCE THAT THE OBSERVED RHYTHM HAS SIGNIFICANCE

TABLE
STRIKES AND LOCK-OUTS IN THE UNITED STATES, 1881-1954

YEAR	NUMBER	YEAR	NUMBER	YEAR	NUMBER	YEAR	NUMBER	YEAR	NUMBER
1881	477	1896	1066	1911	*	1926	1035	1941	4288
1882	476	1897	1110	1912	*	1927	707	1942	2968
1883	506	1898	1098	1913	*	1928	604	1943	3752
1884	485	1899	1838	1914	1204	1929	921	1944	4956
1885	695	1900	1839	1915	1593	1930	637	1945	4750
1886	1572	1901	3012	1916	3789	1931	810	1946	4985
1887	1503	1902	3240	1917	4450	1932	841	1947	3693
1888	946	1903	3648	1918	3353	1933	1695	1948	3419
1889	1111	1904	2419	1919	3630	1934	1856	1949	3600
1890	1897	1905	2186	1920	3411	1935	2014	1950	4843
1891	1786	1906	*	1921	2385	1936	2172	1951	4650
1892	1359	1907	*	1922	1112	1937	4740	1952	5117
1893	1375	1908	*	1923	1553	1938	2772	1953	5091
1894	1404	1909	*	1924	1249	1939	2613	1954	3600 P
1895	1255	1910	*	1925	1301	1940	2508		

*DATA NOT AVAILABLE.

P -PRELIMINARY

THE 17¾-YEAR CYCLE IN COTTON PRICES

1731-2—1953-4

COTTON prices for over 220 years have been characterized by the well known and important 17 3/4-year cycle.

You can pick this cycle out by inspection in the chart of cotton prices, crop years 1731-2—1953-4, printed below. You can see it even better on the two pages next following. On these pages the solid line in the upper chart (Fig. 2) shows cotton prices smoothed. The smoothing eliminates the minor fluctuations. In the upper chart the broken line shows the underlying trend. The lower chart, Fig. 3, shows the percentages that the smoothed cotton prices are above or below the trend. Fig. 3 also diagrams the 17 3/4-year cycle.

The cycle is nearly twice as strong as is shown by the solid line in Fig. 3. This is so because the smoothing process eliminates about half of the cycle.

The typical cycle crests ideally in November 1745 and every 17.75 years thereafter. This would put the present cycle on the way up, due to reach its crest November 1958. Of course there is no likelihood that the crest of *actual* cotton prices will come then. It will surely come earlier or later. (January 29th is *ideally* the coldest day of the year for New York City, but the chance that *this* winter's coldest day will come on that day is slim.)

Ideally, the typical cycle has a strength of about 19% above trend at top, about 16% below trend at bottom. This

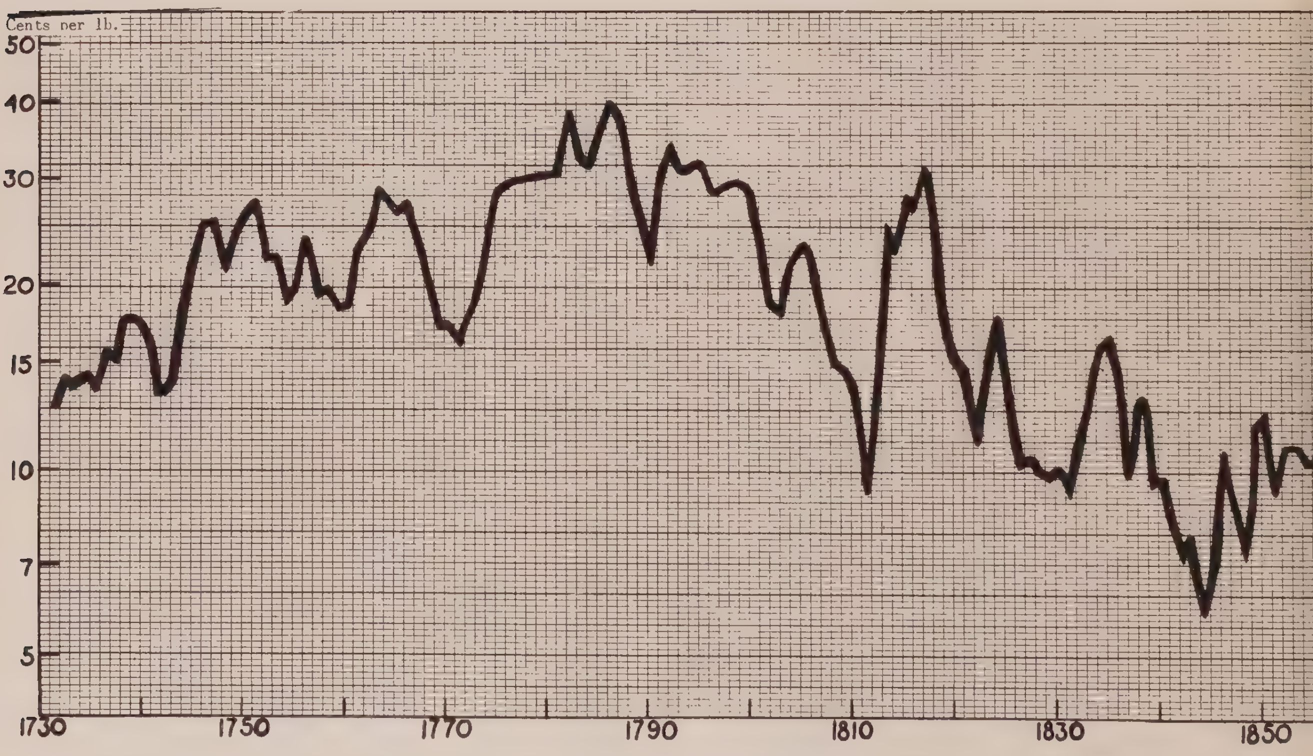


Fig. 1. Cotton Prices (Crop Years) 1731-32 through 1953-54.

Prices during and after the Civil War converted to a gold basis. Prices 1932 forward shown both in gold and in currency. The upper solid line shows currency prices.

means a move of about 35% of trend overall in about 9 years, or about 4% of trend a year.

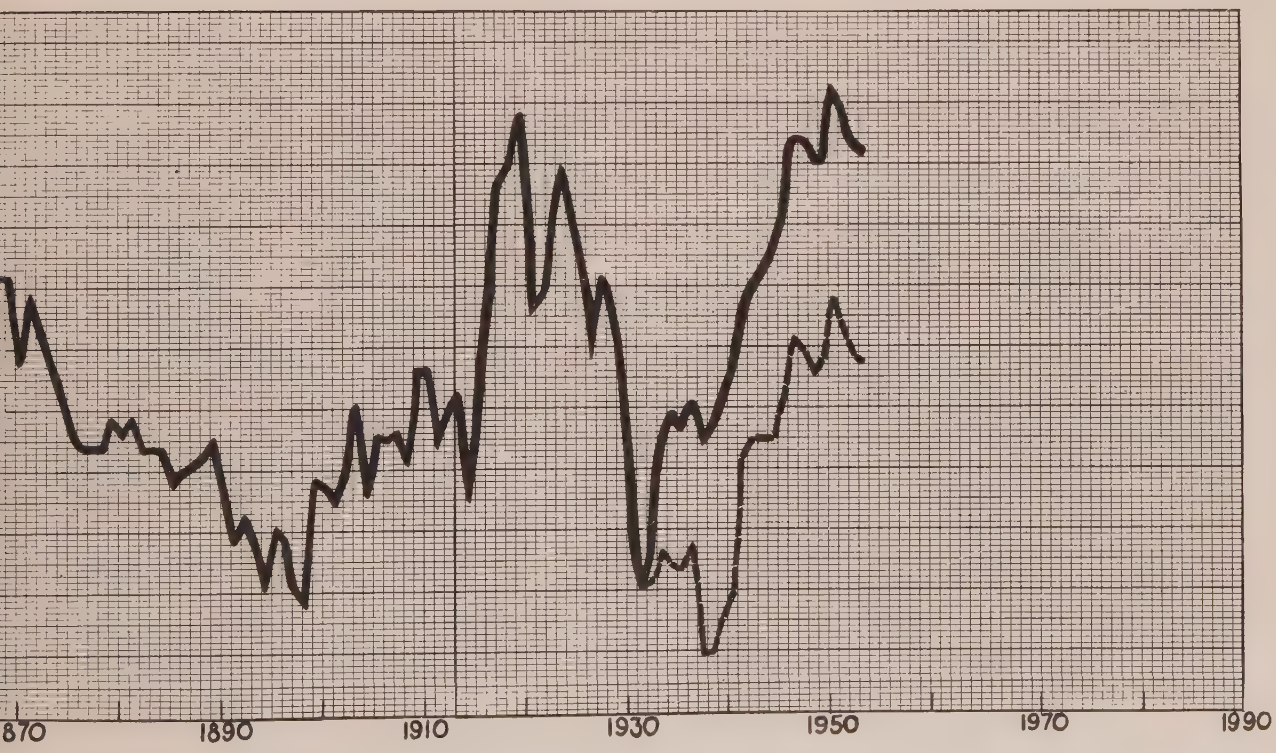
You must not think of this cycle (or any other cycle) in terms of its ideal crest. Think of it rather in terms of *areas* of strength and *areas* of weakness. From this point of view, from now to 1962 or 1963 should be, *on the average,* above trend. The nine years to follow should, *on the average,* be below trend.

In the past we have had eleven complete cycles. Of the 22 tops and bottoms in the smoothed figures (adjusted to a gold basis and for the Civil War, expressed as percentages from trend) we have the following record: Fifteen came on time or within 2 years of perfect timing. Four came 3 years one way or the other of perfect timing. One was 4 years off. One was 5 years off.

We cannot yet speak with certainty regarding the present cycle, for the trend cannot be computed past 1945-46, but all indications are that this cycle will be distorted.

In the actual prices the 17 3/4-year cycle cannot be expected to dominate. However, in the past 220 years, out of 24 possible transactions, 20 of them would have resulted in profit; 4 would have resulted in loss. The net profit for the period would have been 685%.

Let me remind you again that the 17.75-year cycle in cotton prices is only one of many cycles present in these figures. Its like the lard in the pie crust. It is important as an *ingredient* in a forecast, but by itself it doesn't taste too good. If however you combine the 17.75-year cycle in cotton prices with the 5.91-year cycle in these figures, you could expect results better than either alone. If you add in more cycles you could hope for an even better forecast. I shall do all this for you as soon as I can. *E.R.D.*



The lower broken line shows prices adjusted to a gold basis.
The broken line during the Civil War period makes partial adjustment for the war.
Ratio Scale.

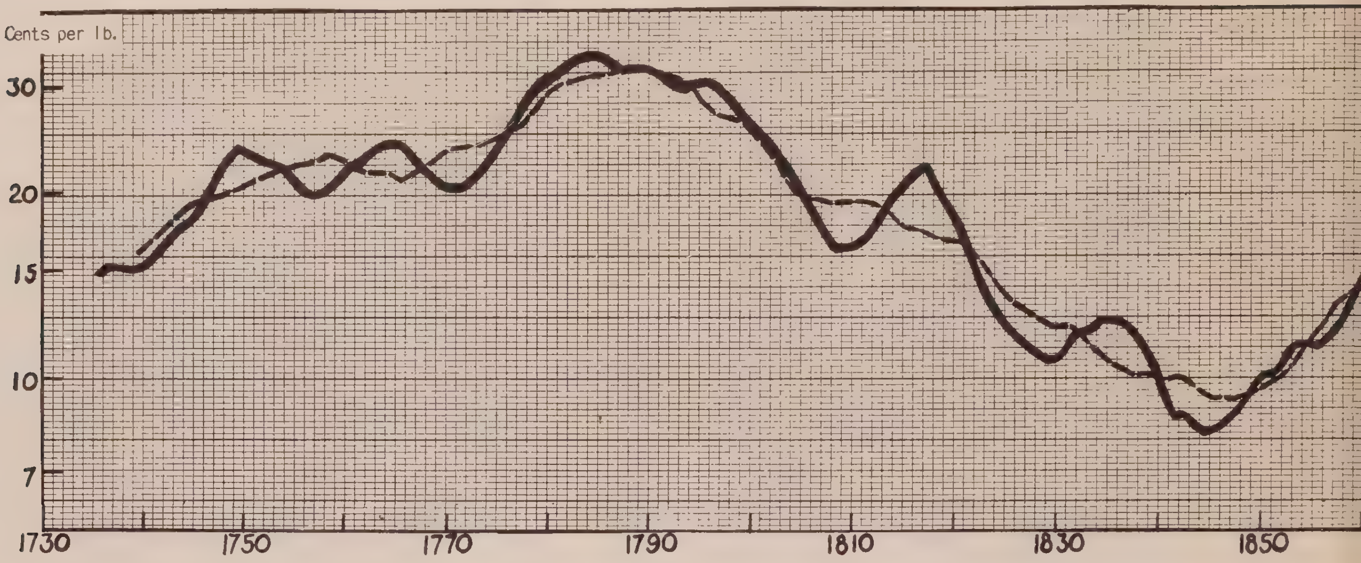


Fig. 2. Cotton Prices, Crop Years 1731-32 through 1953-54, smoothed by a 9-year moving average. (Each point on the curve is the average price for the 9 years centering at that point.) This manipulation gets rid of the minor wiggles and enables you to see the major moves more clearly, but it loses 4 years at each end. The broken line

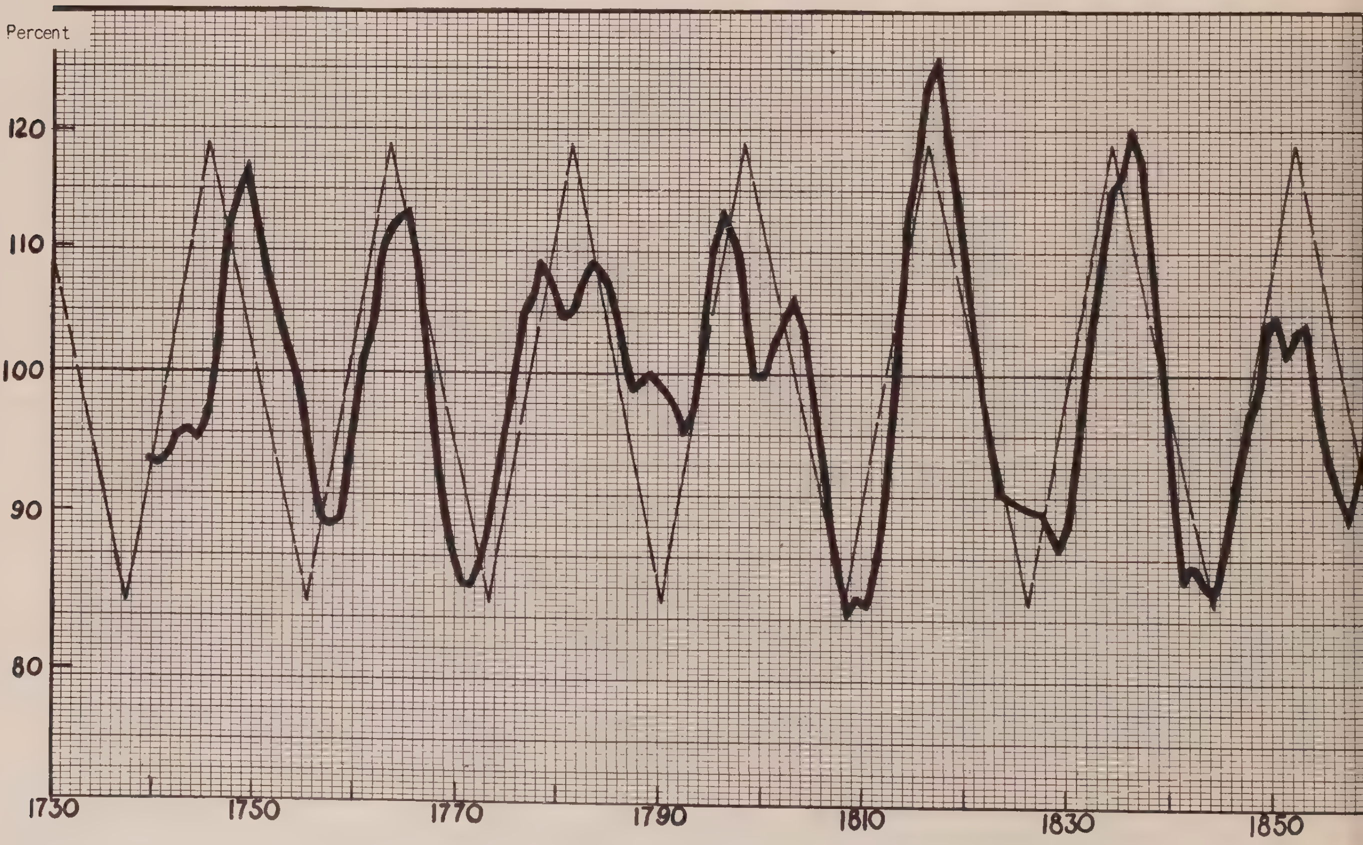
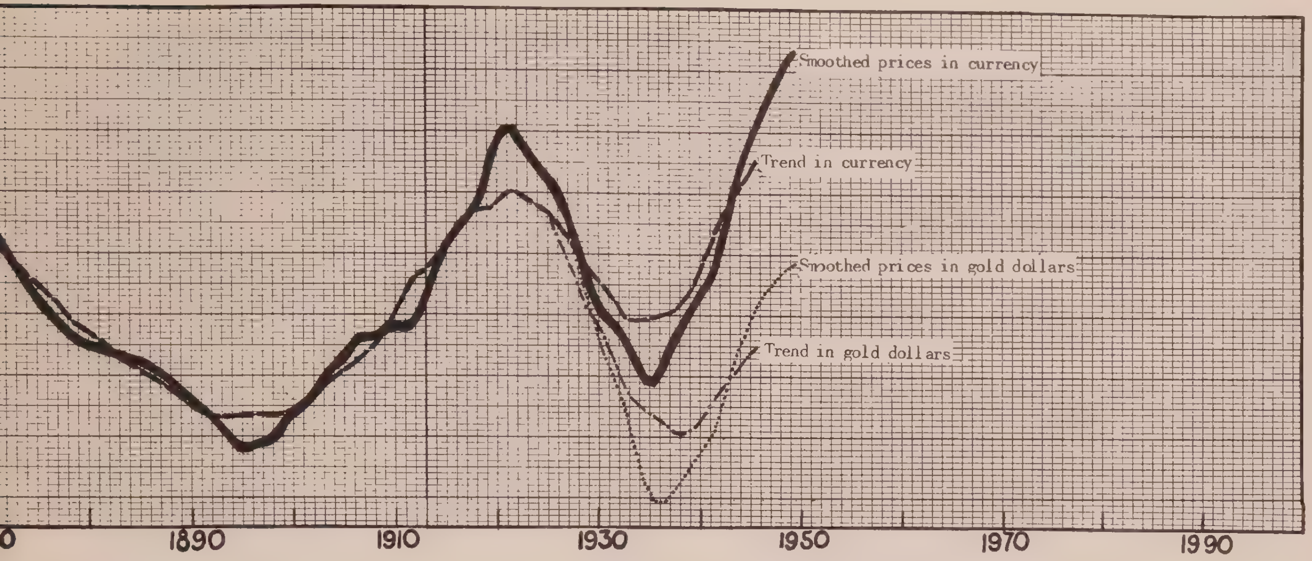


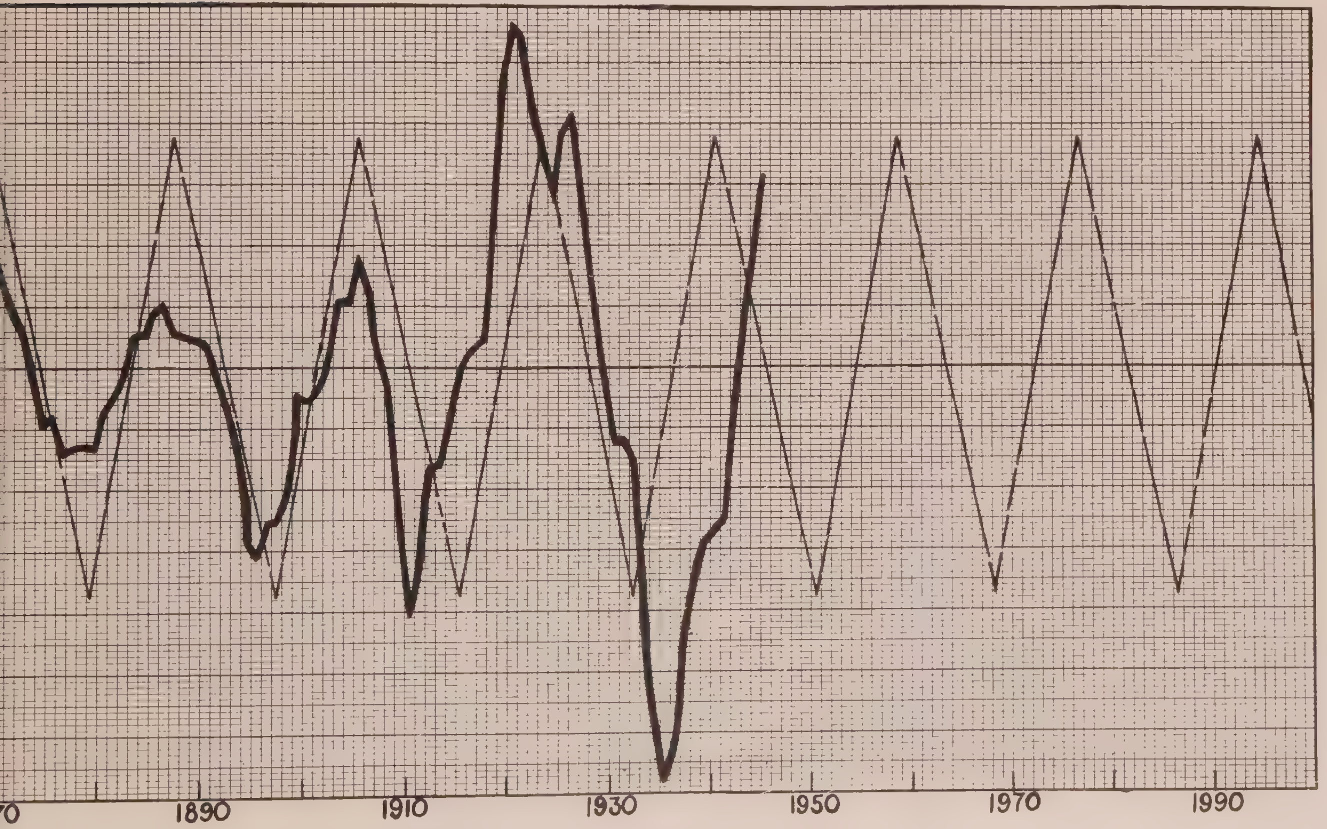
Fig. 3. The 17 3/4-Year Cycle in Cotton Prices.

This curve shows the amounts by which the smoothed cotton prices have been above or below trend. Gold values used from the New Deal forward.



shows trend (a 17-year moving average). This method of computing trend loses 8 values at each end of the series.

In Civil War period we used values adjusted for war. Values from the New Deal forward shown both in gold and in paper money. Ratio Scale.



Note that the curve extends only to 1946 because it is impossible to know the values of the trend past that time.

The regular broken zigzag line diagrams the 17 3/4-year cycle. Ratio Scale.

Letters

A Stock Market Forecast

Dear Sir:

As a member of the Foundation I have run across some interesting things in regard to the 'Benner Cycle' in stock market averages. I am enclosing a sketch showing the results of using the same sequence as his cycles but changing the year to start the series.

I am very interested in cycles having used them in my personal stock market work for some 25 years in which I have worked out a series which I think is rather accurate.

I am wondering if you could isolate the cycles that comprise the 27 year cycle. To me it would seem that all the cycles, both long and short, would *all* bottom or top each 27 years and at the other times they would partly be out of gear.

From 1894 to 1902 we had an 8 year rise.
From 1921 to 1929 we had an 8 year rise.
From 1948 to 1956 we should have an 8 year rise.

There have been only these long rises in recent history. I am wondering then can we figure the market will go to 1956, 1st. or 3rd. quarter? With major, intermediate and minor cycle retarding or pushing forward I am of the opinion that the primary cycle will top in 1956 then go down 3 years to '59 or perhaps '60.

Very truly,
C. R. Ringer

Los Angeles, California

For the benefit of our new members, I should mention that Mr. Ringer is talking about a remarkable forecast of pig iron prices made back in 1875 by a self-styled Ohio farmer named Samuel Benner.

I printed this forecast for you as a supplement to our report for February 1954.

Benner observed that highs of pig iron prices came at intervals of 8, 9, and 10 years and repeat. Lows of pig iron prices came at 9, 7, and 11 years and repeat. As Mr. Ringer says, this behavior creates a 27-year pattern.

The forecast made in 1875 came true from the time it was made up to 1935 with a gain loss ratio, based on imaginary trading, of 31 to 1. It is the most remarkable price forecast ever made.

Mr. Ringer is attempting to apply a modified version of Benner's pig iron price pattern to the stock market with what success you can see in his chart on the following page.

It will be interesting to see how Mr. Ringer's expectations work out.

In Reply to Mr. Ringer I said:

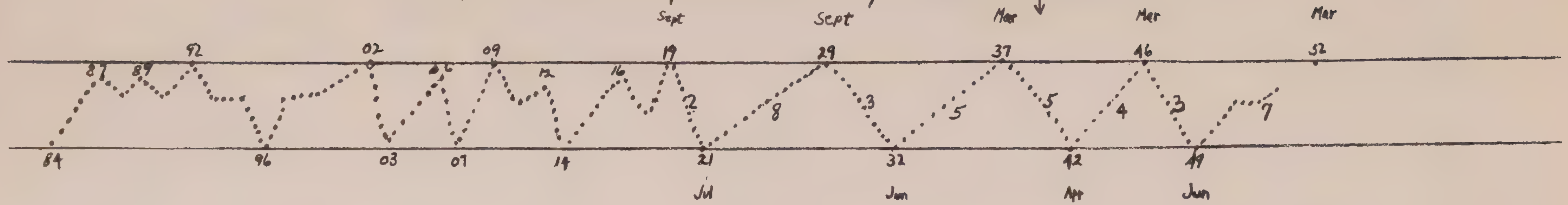
Dear Mr. Ringer:

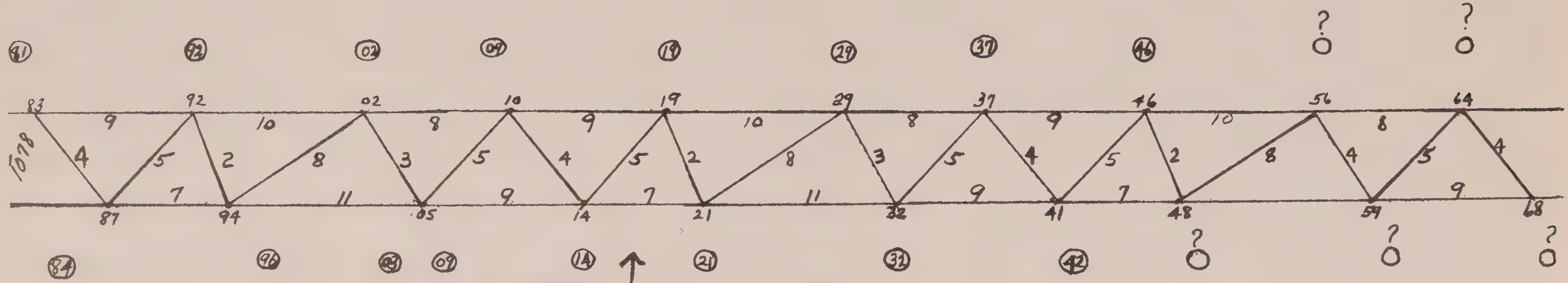
I agree with your deduction that there must be several important cycles coming together at *about* 27-year intervals. That is what made the Benner forecast tick. Therefore, the length of the cycles must be *about* a half of 27 years (13.5 years), about a third of 27 years (9 years), about a fourth of 27 years (6.75 years), about a fifth of 27 years (5.4 years), about a sixth of 27 years (4.5 years), and so on.

It would be comparatively easy to isolate these various cycles in pig iron prices, and in the stock market if they are there. In fact I have already found in the stock market the cycle about 9 years long. It proved to have a length of 9.2 years. I also found the cycle about 6 3/4 years long. It proved to be a 6.86-year cycle. Likewise I found the cycle about 5.4 years long. It, on its part, proved to have a length of 5.5 years. For details see my report for June 1954.) It would be easy to look for the other cycles, both in pig iron prices and the stock market. I shall do so as soon as I get a few extra hours.

Ever cordially yours,

Approximate Tops & Bottoms of Stock Market





Revised Benner-Cycles by CRR

Same series Tops = 8-9-10 Increasing series Sum of any 3 Adjacent Cycles = 27 years
Same series Bottoms = 11-9-7 Decreasing " Average of " " " = 9 years

10 year Top cycle moved one cycle Back as shown by original Benner [series Beginning at 1919]

11 year Bottom Cycle moved one Cycle Foward as shown by original Benner [series Beginning at 1932]

O = Actual year Market – Top or Bottom (Green) = Market Data prior to Dow Averages Taken from Chart Published by Barron = (9 year ago)

Tops = off only once = (1909 - instead 1910) in over 50 years

Bottoms = Missed 2 years 1905
= " 1 year 1941 = War bottom 1942 Distorted
= " 1 " 1949 = " " distortion Carried forward

If we had only Known of This series in 1902
↑
Foundation Could have a wonderful Endowment Fund.

Remarks

Next Top Should be in 1956 = Since Tops been on Time so closely
" Bottom " " " 1959 (if distortion Holds Then 1960)

Tops = seem to Come in 1st or 3rd Quarter year
Bottoms = " " " " " " " "

C. R. RINGER

THE MODIFIED GEISINGER INDICATOR

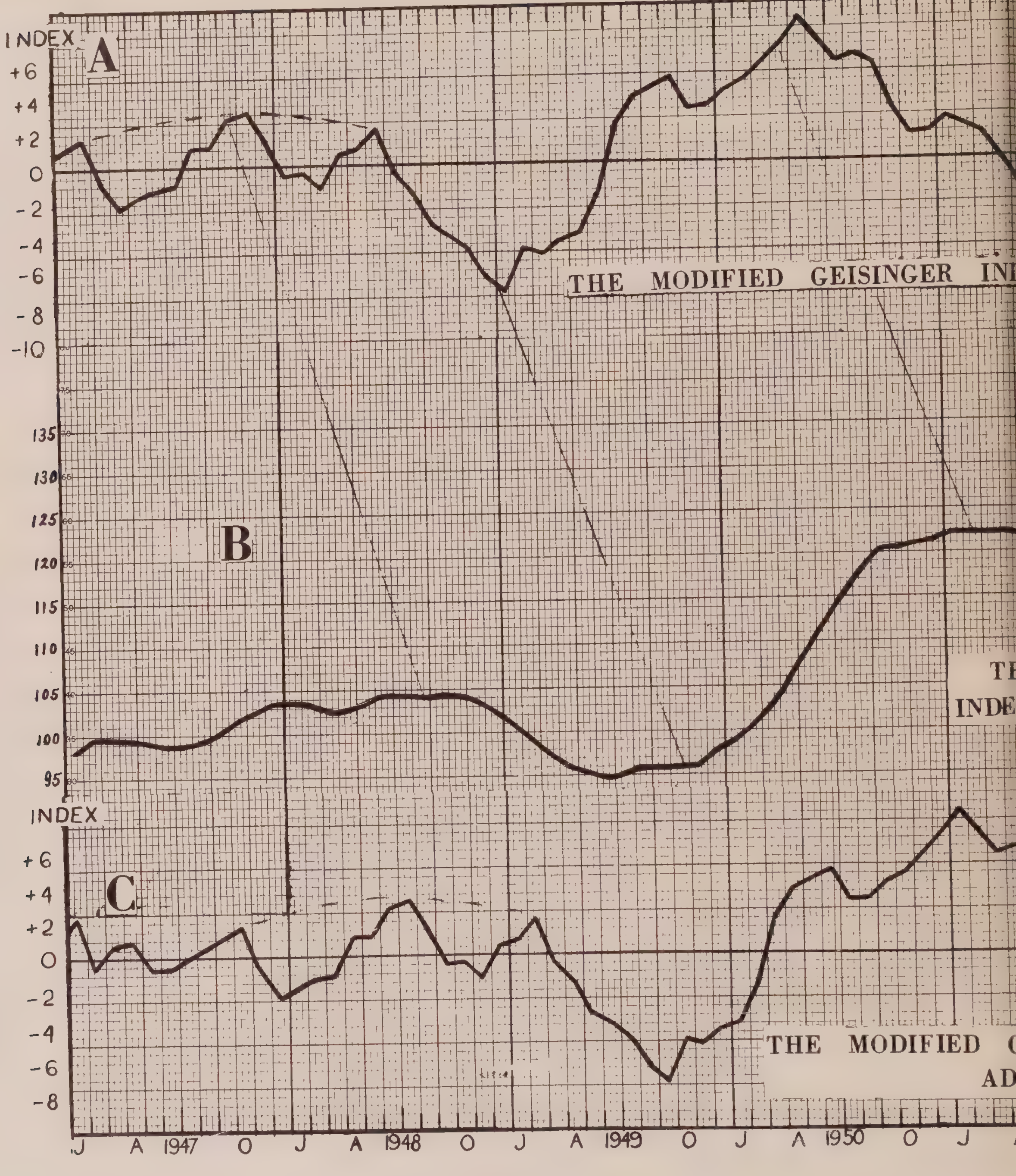
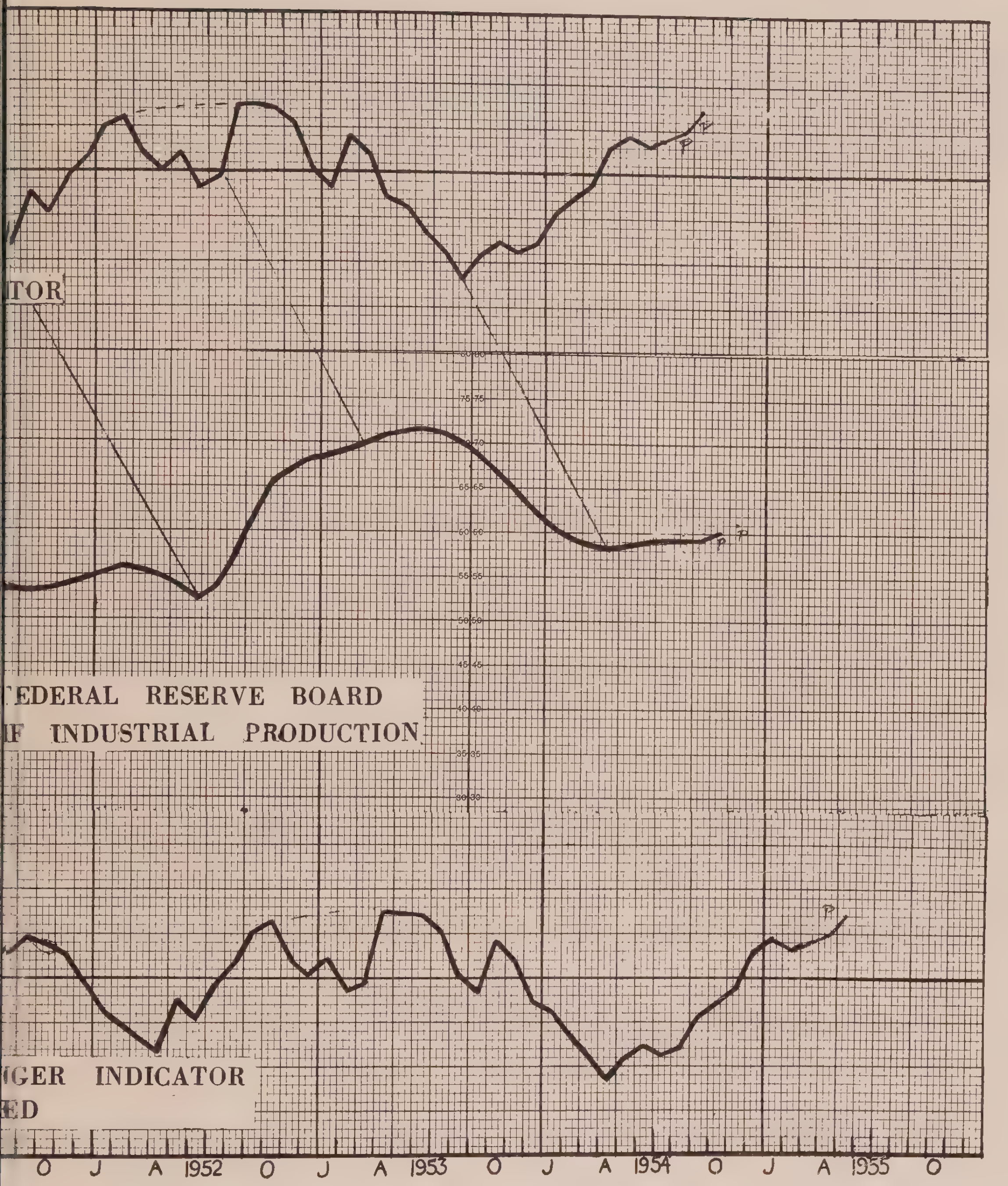


Fig. 1. Curve A. The Modified Geisinger Industrial Production Indicator Curve. This curve is derived from certain figures which are published monthly in the *Survey of Current Business*. It tends to turn about 8 months before the Federal Reserve Board Index of Industrial Production.

Curve B. The Federal Reserve Board Index of Industrial Production adjusted for seasonal variation and smoothed by a 3-month moving average. The value for the latest available month is shown by a dot.

Curve C. This Curve is the Modified Geisinger Industrial Production Indicator Curve advanced by 8 months. This process projects part of the curve into the future. If the relationships of the past continue, the projection gives some hint of what may happen to the Federal Reserve Board Index of Industrial Production (Curve B).

OF INDUSTRIAL PRODUCTION



THE FORECAST

The Modified Geisinger Indicator continues the advance it began in August of 1953. The turn which this Indicator made in August of 1953 foreshadowed by eight months the advance in the Federal Reserve Board Index of Industrial Production which began April 1954. The continued advance of the Indicator suggests a continuing increase of industrial production until at least May of 1955. E.R.D.

Questions & Answers

Question:

Do you think the government should take account of cycles in connection with trying to time the next war?

Answer:

Yes. However, a great deal more research should be conducted before officials would be justified in leaning heavily upon this method of forecasting.

Question:

Do the Russians know about cycles?

Answer:

Some important research regarding cycles has been conducted by Russians. How widely their work is known in Russia I do not know.

Question:

How do you use a knowledge of cycles in your own everyday affairs?

Answer:

Chiefly for general orientation. It gives me a general idea of what to expect in business activity, in security prices, and in connection with the next war.

Question:

If you get your $100,000 endowment, how will you spend it?

Answer:

How the money is spent would be up to our committee.

My own ideas are that the money should be used to buy *permanence*. As it is we operate from day to day and on a hand to mouth basis. What we need more than anything else is the assurance of continuity.

An endowment would provide continuity. Income from the endowment, with what else we could scrape up, would permit the employment of an Assistant Director. Such a man could prepare himself to carry on when I am no longer able to. An endowment would thus make long range planning possible. It would buy stability.

Question:

Why don't you abolish the monthly reports and spend all your time on research?

Answer:

What's the good of research that does not get published? It just fills files which get burnt after you are dead.

Then too, there is an advantage in having to meet a deadline. It makes you finish things. If you don't have to go to press, there is always the temptation to say, "If only I knew a little more I could do a better job." And so you keep on and on, never tying things up. Or at least I do.

Question:

Do you feel you are getting somewhere in the study of Cycles?

Answer:

Sometimes I feel we are. Sometimes I feel we are not. Lately I have been encouraged by the extent to which I find cycle lengths to be related and by the extent to which forecasts based on cycles continue to come true. On the whole I think we are making progress.

Question:

Do you attach any significance to the extent which earthly cycles seem to correspond to the length of time it takes different planets to go around the sun?

Answer:

The correspondence is certainly intriguing but much work needs to be done before we can say that a relationship has been proved.

EXCERPTS FROM

CYCLES

THE SCIENCE OF PREDICTION

(CHAPTER XIV)

by EDWARD R. DEWEY
Director, Foundation for the Study of Cycles

and EDWIN F. DAKIN
Associate, Foundation for the Study of Cycles

TOGETHER WITH 1955 SUPPLEMENT

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XIV

War and Its Dislocations

THERE IS some limited evidence that wars and periods of war activity may have a rhythmic periodicity in the affairs of men. Dr. Lin Yutang, in *My Country and My People,* * reproduces three charts prepared by Dr. J. S. Lee for a study, "The Periodic Recurrence of Internecine Wars in China," published in the *China Journal of Sciences and Arts* in 1931. The Chinese people have a continuum of history far exceeding that of any other people with extant records for study. Dr. Lee found two 800-year periods in Chinese history, and the beginning of a third, which when compared show striking parallelism in their periods of peace and disorder. He concluded that the parallelism "far exceeds the limits of probability" and is "perhaps too exact to be expected from the proceedings of human affairs."

Each period began with a short-lived but militarily strong dynasty, which unified the country after centuries of disorganization and civil strife. Then would follow four or five hundred years of peace. Then a change of dynasty would be followed by successive wars. The capital would be moved from the North to the South, secession and rivalry between North and South would create intensified conflicts, subjugation of the dissidents under foreign rule would result, and the cycle would end.

Spengler, who believed that all cultures have a life course in the general order of 1,000 years, and saw comparable phenomena emerging at parallel periods in the life course of each culture, would have found Dr. Lee's data of irresistible interest. Spengler, for instance, saw evidence indicating that in the "springtime" of a culture its life spirit always blooms in great architecture, such as the cathedrals of the Renaissance. Dr. Lee mentions the undertaking of vast architectural projects in the early part of each of the 800-year periods he cites. In the first 800-year period (221 B.C. to A.D. 588) there was the building of the Great Wall under the Ch'in dynasty, and the colossal palaces. In the second period (589–1367 A.D.) the Grand Canal was built under the Sui emperor, and also palaces of great magnificence. In the beginning of the third cycle (the Ming dynasty [1368 A.D.] to the present time, and hence

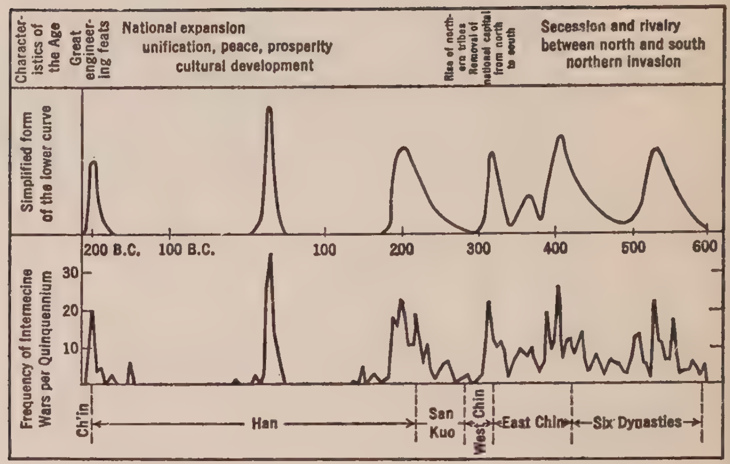

Fig. 1-A. First Chinese Epoch (800 years: 221 B.C.–A.D. 588.

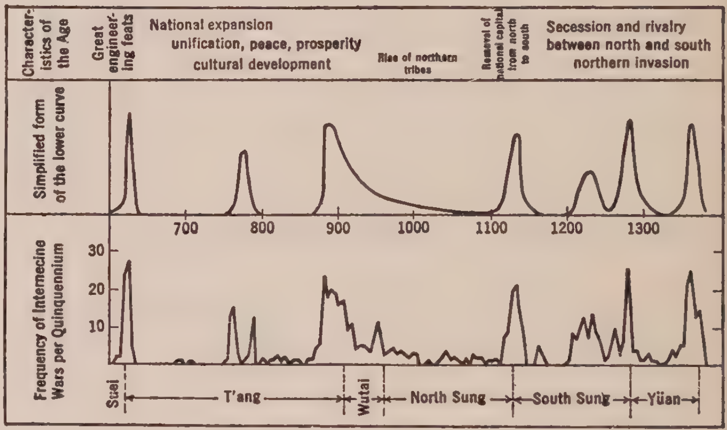

Fig. 1-B. Second Chinese Epoch (780 years: 589–A.D. 1367.

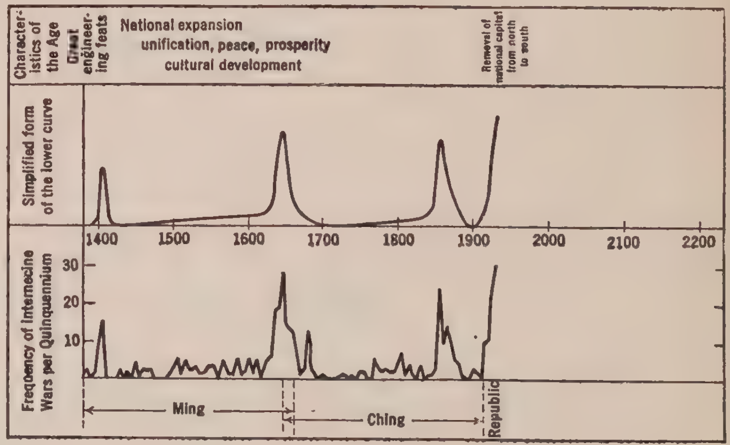

Fig. 1-C. Third Chinese Epoch (A.D. 1368 to present).
All three charts after J. S. Lee and Lin Yutang.

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* John Day Co. and Reynal & Hitchcock (1935), pp. 30–31.

uncompleted) the Great Wall was reconstructed, new canals and dams were laid out, and Peking was built.

The charts which Dr. Lee created, on the basis of the records at his disposal, to picture visually the parallelism of wars in these three Chinese periods, are reproduced in Fig. 1. While we may regard with due reservations the wave lines intended to show the frequency of internecine wars per quinquennium, in view — among other reasons — of the great antiquity of the history involved, no student of the subject can fail to be impressed with the regularity in the parallels, and with the thought that the subject deserves far greater study than it has yet been accorded by scientific research.

Spengler, convinced of the validity of such parallelisms, declared that periods of war and social upheavals show up at corresponding points in the life of every culture. He believed, for example, that the Napoleonic period in our "Western" culture corresponded closely to the Alexandrian period in the classical, and predicted that our present "Caesarian" age would duplicate, with wars of extermination wiping out whole nations, a similar period in the history of classical Rome.

But scientists must still regard these historical parallels as more interesting than scientifically fruitful, in view of our failure to devise ways of *measuring* the phenomena. In the present state of our knowledge, we as yet have no satisfactory statistical approach to wars, for instance, that would guide the undertaking. Hotelling's effort to weigh wars statistically by measuring their impact on prices seems hardly adequate. Our Spanish-American War, for instance, was only a fracas, compared to some of our other conflicts. It had little immediate effect on the economy. And yet, by consensus of the histories, it marked America's emergence as a first-class power.

Conversely, a historian five hundred years hence might possibly find our participation in World War I little more than another border adventure. The soldier deaths that occurred were fewer than our annual civilian toll from automobile traffic a few years later. The privations that were suffered by the American population were considerably less than in the great peace depression of 1930–1932. Statisticians similarly could hardly feel justified in taking price inflation as a guide to measuring the importance of World War I to American life. For World War II, which demonstrably has created an unprecedented disturbance and distortion in our economy, had certainly by 1946 created no more price inflation (and probably less) than its predecessor a quarter century previous, although taxing our resources far more basically. It is worth noting, in passing, that World War II began for America — economically — in 1939, and not 1941. Pearl Harbor did little more than crystallize a *de facto* situation.

Until our social sciences develop far greater resources than are now at our disposal for defining and measuring wars, we shall doubtless continue to lack data that will permit us to make sound generalizations concerning the cycles in their incidence, or that will serve any other useful purpose beyond that of extremely tentative hypotheses.

In such a problem we see, exceptionally magnified, the difficulties always inherent in studying an organism of which the student is himself a member. As has already been noted, it is extremely important, for scientific progress, to try to observe as if one were *outside* the frame of the phenomena being studied. What could be learned about man, for instance, by one inquiring cell in a man's body — even granting to this hypothetical cell the highest gift of observation that you please — and giving it, through the blood stream, mobility and power to visit every nook and cranny of the man's physique?

Every person is to be comparably regarded, in one aspect, as a cell in the social entity. In thinking about certain surrounding social phenomena, he must try to detach himself imaginatively from the organism. His measure of success in this is one measure of his scientific progress. It happens that our society has seen little such scientific thinking about war. We cannot yet — by means of a knowledge of cycles — predict the timing of war's arrival. But we have data to make estimates concerning certain associated reactions, in the event that war has come.

First, by knowing the cycles involved we can — ideally at least — determine what would have happened had there been no war. After any given war we at least know what did happen. The difference can be viewed as the *net* distortion due to war. Thus, in Fig. 2 the dotted line indicates what was due to happen, the solid line what

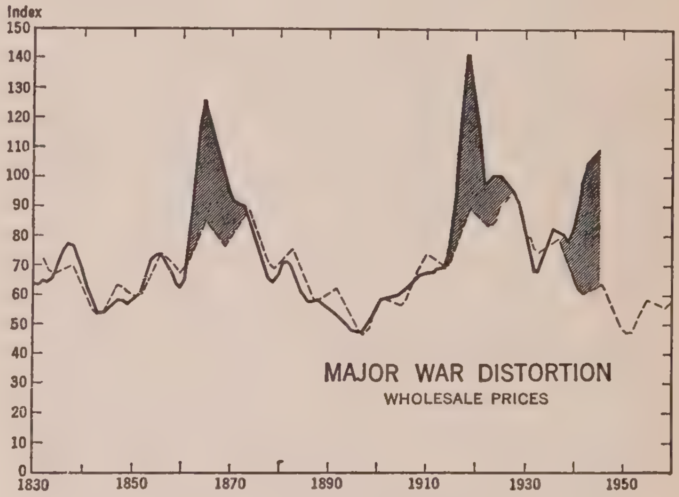

Fig. 2. War-Time Distortion

Chart showing distortion in the Wholesale Price Index in time of War. The solid line shows the three year moving average of the Index of Wholesale Prices in the U. S., 1830–1945. The broken line shows the synthesis of the regular 9-year and 54-year cycles. The shaded areas show the difference between the Index and the regular pattern for the periods of the Civil War, World War I, and World War II.

The 3-year moving average has been extrapolated to 1945. The shaded areas begin one year prior to the outbreak of wars, since in a 3-year moving average the effect of the first year of war is extended one year backward.

It is interesting to note that in spite of the magnitude of the distortion, the *timing* of the peaks happens to coincide with the normal timing of the 9-year cycle. It is also interesting to note how nearly equal are the distortions.

did happen, and the shaded area the action and reaction of the war, in regard to average wholesale prices in the United States.

Second, by knowing our cycles we can have useful advance knowledge about the *timing* of peaks and valleys, even in wartime. Short cycles ride on the back of the war disturbance, as well as on the back of longer waves. The war seems to make little or no difference. In Fig. 3 the black line shows long waves and/or war; the dotted line shows, for simplicity, *one* short wave riding the long one.

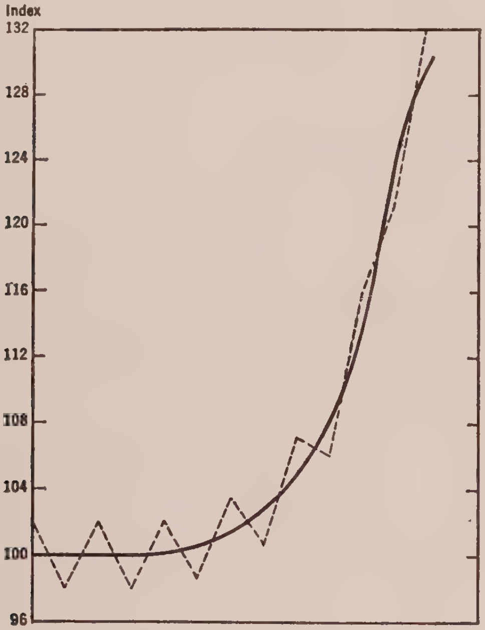

Fig. 3. Persistence of Wave Influence

Diagram to show how short rhythms often continue to influence a series, despite the impact of a longer wave or some accidental distortion such as a war.

The solid line shows the effect of the longer rhythm or the war. The dotted line shows how a regular 6-month rhythm continues to influence behavior. All waves are exactly 2 per cent in amplitude, but the distortion caused by the rapid rise of the "trend" line obscures this fact. The vertical scale has been greatly exaggerated.

Third, *only* by knowing the cycles involved, and by adjusting for them, can one know correctly the underlying *trend* in effect at the outbreak of a war. It is necessary to know this, if one is to project — through the war distortion — the levels to which affairs will normally return after the war is over — unless the long prevailing trend is to be completely overturned.

These charts serve parenthetically to illustrate a fact that has been stated before: The forces represented by our rhythms are quite evidently not the only forces at work in our society. There are doubtless many sporadic ones in addition. But the rhythms we have do show a regularity which persists, and usually dominates, regardless of what other forces are present on the scene.

On many of the economic charts and wave patterns we know about, a period of war registers itself as a sort of volcanic explosion above the level of the prevailing trends. All the waves revolving around the trends are tossed high in the air, as it were. Yet the actual wave patterns — as patterns — are often less disturbed by war than one would expect.

We have already seen, for instance, that it would be logical to suppose the steel industry, required during modern war to work at top capacity, would at least have a steady rate of production in such a period. Nonetheless, in World War I at least, we find evidence that the wave pattern persists; it merely goes on at higher levels. Strikingly enough, the pattern of waves in the stock market undergoes relatively small disturbance, and has *always recovered its periodicity* if that has been disturbed.

Still more: Regardless of the degree of disturbance, once the war "explosion" has subsided and the disturbances recede, the previously prevailing trends and levels have usually been re-established in our economy. *Previous wars did not, in themselves, alter basic underlying trends,* insofar as our statistical data show them.

But wars often do alter certain seemingly established relationships within an economy. It is clear, for instance, that no such fantastic, unprecedented spurt in the volume of United States manufactures, as traced in the pattern on page 25, could occur without vast straining of the social gears.

One of these strains, as we should know, is clearly revealed in what happened to wage levels in the United States, as these manufactures were produced. An unprecedented shift in the pattern of U. S. income levels took place. For instance, it has been estimated that in 1939 there were 2 million families with an income of no more than $200 a year, 5 million with an income of not more than $500 a year, 1 million more with an income of not more than $700 — making 8 million families of very low income, relatively speaking. Another 11 million families lived in a slightly higher category, still another 8 million existed in good middle-class comfort, and 2¼ million others were receiving top incomes.

There had been much talk of the redistribution of income started in 1933. But the real redistribution waited for the war era of the forties. Many of the 19 million families at the bottom of the heap moved swiftly, after 1941, into incomes that had previously been enjoyed only by the middle class. It has been pointed out, in this connection, that the greatest increases in currency circulation in this country, where the increase had been phenomenal even during the prewar years, occurred in some of the "poorer" districts of the nation. The increase in just four years, from 1939 to the end of 1943, was 520 per cent in the Federal Reserve District of Atlanta; 450 per cent in Richmond, Virginia. In Boston, on the other hand, it was 192 per cent.

Such increases occurred in a period when the former middle and upper income groups were being stripped of their previous margins of income over expenditures, by income and other taxes never previously even imagined.

In the same four years, income taxes rose from under 1½ billion dollars to almost 20 billion. The vast numbers who had previously been on the income fringes, and were now thrust up into income levels of new importance, contributed to these tax payments. But being without long-term economic commitments — life insurance, long leases, etc. — that are accumulated over the years by people used to enjoying generous incomes, these newcomers to the ranks of prosperity had large sums left them after taxes for use in the merchandise mart. This fact was reflected in government reports that consumer expenditures steadily climbed to all-time highs, with department store sales in early 1946 outranking comparable figures for all previous years. Meanwhile, the Census Bureau could report that 15,000,000 American civilians shifted their homes, in the war-years, to " improve " themselves.

American citizens as a whole have realized vaguely that income distribution is a subject of wide political interest; they have seen it become one of the subjects fought over in major political campaigns following the depression of the 1930's. Few of them, however, seem to know that one school of economists regard income distribution as one key to the outlook on a society's stability. The subject has no light to throw on the analysis of trends and cycles; but it does have possible bearing on interpreting certain data that analysis of rhythms and trends puts in our hands.

The law of income distribution has been stated by Vilfredo Pareto (1848–1923) in a formula that has been rephrased by Davis as follows:

> In all places and at all times, the distribution of income in a *stable* economy . . . will be given approximately by the empirical formula
>
> $$y = ax^{-v}$$
>
> where y is the number of people having the income of x or greater, a is a constant, and v is approximately 1.5.

This equation has implications that are basically simple. It means that in every *stable* community there will always be a given percentage of people in the top income bracket, in the bottom bracket, and in the middle. The distribution is a fixed constant, whether the community is rich and prosperous or poor.

Obviously such a law, if true, strikes at the fundamental tenets of many professional world-improvers. Thus, efforts to discover a flaw have naturally not been wanting.

The " reason " for such a law has baffled many. Pareto himself said:

> These results are very remarkable. It is absolutely impossible to admit that they are due only to chance. There is most certainly a *cause,* which produces the tendency of incomes to arrange themselves according to a certain curve. The form of this curve seems to depend only tenuously upon different economic conditions of the countries considered, since the effects are very nearly the same for the countries whose economic conditions are as different as those of England, of Ireland, of Germany, of the Italian cities, and even of Peru.*

Carl Snyder, in 1936, advanced an explanation of the law, in the thesis that the observed distribution of incomes is only one example of a more general law of inequality which has been referred to as the law of distribution of special abilities. (Schoolteachers are familiar with one form of this law, in the fact that most grades are " average," while the number of those in the top fourth of the class will be about equaled by those in the bottom fourth.)

However that may be, the Pareto formula for social stability has possible implications for the future of any nation like the United States.† And it offers interesting material for those who wish to speculate about the possibility of new trends in our economy. Either the United States seems due for a great wage deflation, or new trends are in the making.

World War II was in one respect like the War of the Revolution. It was fought during a period of decline of the great 54-year price cycle, or groundswell, that has underlain prices in this country as far back as there are figures.

The three wars that created the three great peaks familiar to all observers of wholesale price charts covering the past 150 years were: the War of 1812, which occurred when the 54-year rhythmic pattern was approaching its peak in 1817; the War Between the States, which occurred when this same pattern was approaching its peak in 1871; and World War I, which occurred when the long price wave was climbing to its peak in 1925.

Undoubtedly, these wars added great amplitude to current swings of the price rhythm. We have no way — as previously stated — of forecasting the extent of such a distortion in *advance* of its arrival. But it is significant that during all three wars the distortion exercised on wholesale prices seems more or less comparable, as we note it in retrospect on the price charts. This is the more interesting because World War I exerted in some respects less of a strain on our national resources than the two war periods preceding it.

By sharp contrast, World War II was fought wholly in a period when our 54-year price rhythm was downward in its pattern. Thus any upward distortion this war period exercised on prices may be assumed to have been effected *against* the influence of the 54-year rhythmic tendency, and consequently to have been *less* than it would otherwise have been.

In view of the world situation and the enormous volume of money in circulation, possibility of any real price decline in the late forties seemed incredible to most 1946 observers. But skeptics could declare that price levels are related not only to the volume of money in circulation, but also to the volume of money turnover. And they could also ask pointedly whether world famine and decay could really make for booming markets.

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* *Cours d'économie politique,* Vol. 2, p. 312.

† It should be noted that the Pareto value of 1.5 is given as an approximate. N. O. Johnson, making an elaborate investigation of the law, on the basis of income tax data in the United States from 1914 through 1933, estimated values ranging from 1.34 in 1916 to 1.76 in 1932. It has been pointed out that a fairly wide variation has at times existed without undue social unrest, and it seems agreed that research has as yet produced no way of estimating " critical values." H. T. Davis correctly deduced the coming of serious social disturbance in France, on the basis of the 1935 Pareto index for that nation of 1.85. Figures for Germany, which would offer a good test for the period of 1920 to 1935, seem not to have been compiled. It is perhaps worth remembering that American conditions in 1932, reflected in the figure of 1.76, were such that some of the " best " people speculated on the coming of " the man on horseback." And, in fact, revolutionary political, economic and social changes did spring from that year, to become more or less permanently incorporated in the American scene.

We know, of course, from experience that business can be good and the nation can enjoy prosperity in a period of declining wholesale prices. Price levels are certainly not the only determinants of business prosperity. It is nonetheless apparent that any extended period of declining prices following World War II can result in serious problems for a nation with an unprecedented debt,* and with a debt charge burdensome even at high price levels — a nation whose populace has been geared, by admonitions over a long period, to expect vast inflation as a " result " of this indebtedness. Where the debt is so large (see Fig. 4), and so many are out on traditional limbs expecting inflation to go on growing up to the sky, national reaction to a deflation might force even more radical changes in our economic system than would have been effected by the inflation millions have feared.

This is not a prediction that it will. We have no scientific data to warrant such a prediction. Our data here deal with price levels alone. But in the face of the data, one would be shortsighted not to consider possible social implications. Great changes in our economic and social organization may be the outcome. Walter Lippmann, for instance, has declared:

> If we fix our minds upon the fact that the capacity to produce is the nation's wealth and upon the dislocation of that capacity as the supreme evil to be avoided, we shall, I believe, have hold of the saving truth. This is not the economics we were taught in school. But it is the economics we are going to have to learn in order to live in this century.†

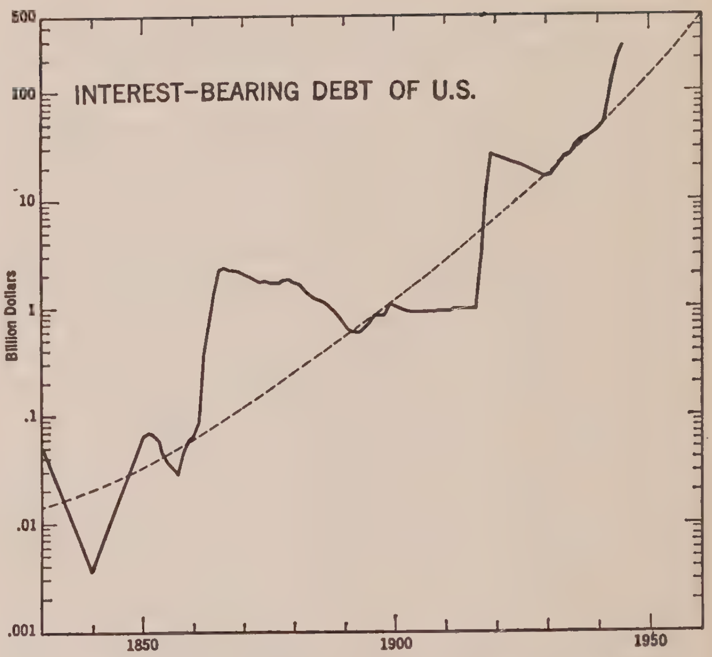

FIG. 4. INTEREST-BEARING DEBT OF THE UNITED STATES

1830–1945. Data decennial 1830–1850; annual thereafter. A trend is shown, projected tentatively to 1960. *Ratio scale.*

It will be noted that the trend is concave *upward,* counter to all laws of growth. One may conclude that this situation cannot continue permanently.

Our three wars previous to that of the forties happened to fall at about the same place in the cycle; the postwar patterns were more or less similar not, presumably, because of the wars, but as the outcome of the phase of the cycle. This provides us today with opportunity to see whether or not it is the war or the cycle that governs postwar behavior. If war governs, we should expect — following World War II — a slowdown of about a year for industry to readjust, and then an upturn to a normal peak corresponding to that of 1920; then a brief collapse, corresponding to the depression of 1921; then eight years or so of advance; and then a major collapse, to be entitled " The Second Postwar Depression."

If, however, rhythms govern, we should not expect the events that followed World War I to repeat themselves. Rather we should expect the so-called First Postwar Depression to be the major one; we should find that the 8- or 10-year period of crest which came after War I will not be so conveniently available this time to stave off prompt retributions for our trespasses.

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* In early 1946 the Federal Reserve Bank of New York estimated that total indebtedness in the United States, both public and private, amounted to at least 350 billion dollars, or double the prewar peak reached in 1930. In the intervening period most of the debt had been shifted onto the shoulders of the federal government. At the end of 1945 the federal net debt amounted to 65 per cent of the national indebtedness, compared to only 22 per cent at the end of 1940. Meanwhile, private indebtedness fell from 68 per cent of the total in 1940 to around 30 per cent by the end of 1945. Debt of the states and local governments fell in the same period from 10 to under 4 per cent. Average interest rates fell about one-half between 1930 and 1945, so that the interest burden on the economy in 1945 was approximately that in 1930, or a little more, according to the estimate.

† New York *Herald Tribune,* Jan. 18, 1944.

1955 POSTSCRIPT TO CHAPTER XIV

CHAPTER 14, as you know, dealt with war and its dislocations in relation to cycles. It advanced and expanded upon seven main ideas. These were as follows:

Seven Main Points

1. Wars may come at rhythmic time intervals.
2. Cycles reassert themselves after wars in accordance with the pre-war timing.
3. By knowing cycles and comparing actual behavior during a war with the behavior called for by the cycles, you can measure war distortion.
4. Short cycles continue during war.
5. Income distribution is a possible key to a society's stability.
6. The government debt is increasing at an increasing *rate*.
7. Post war behavior offers a test of cycles.

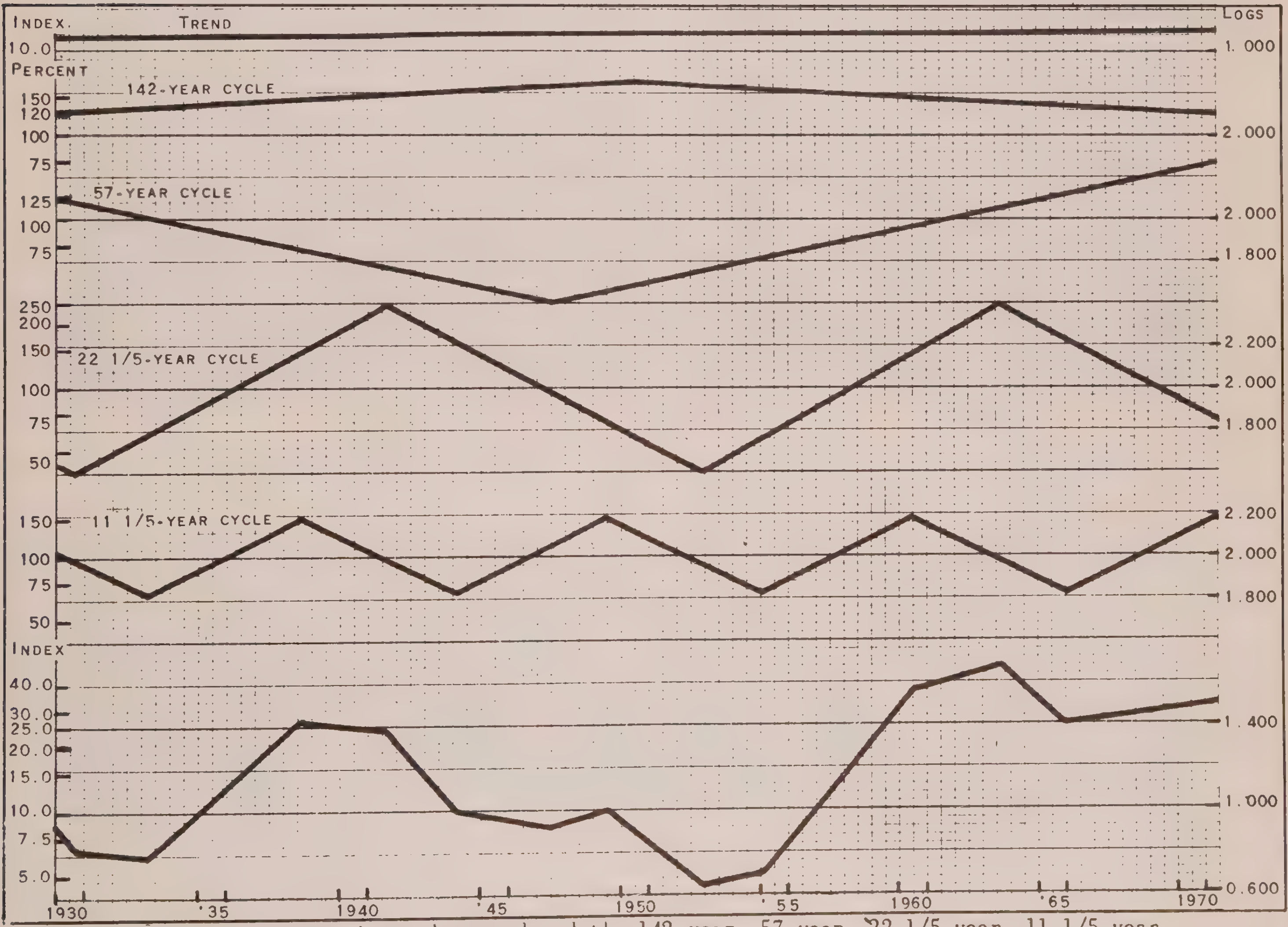


Fig. 6. This chart shows the trend and the 142-year, 57-year, 22 1/5-year, 11 1/5-year cycles as found in Professor Raymond H. Wheeler's index of international battles. The bottom curve represents the synthesis of these waves together with trend. The synthesis has been projected to give a general idea of future probabilities, if these cycles continue.

Comment

I would now like to comment in turn on each of these points.

1. Research which has been conducted since *Cycles: The Science of Prediction* was written show that wars *do* come at rhythmic time intervals. More of this later.

2. There is abundant additional evidence that cycles *do* reassert themselves after wars. For one example refer to the story about the 41-month cycle in the factory sales of passenger cars which was printed in the October 1954 issue of *Cycles*. Many other examples of behavior of this sort have been called to your attention from time to time.

3. The third idea—that war distortion can be measured accurately only by knowing, through a knowledge of cycles, what would have happened if there had been no war—is a truism. It needs no further elaboration.

4. There is nothing to add to what was said in the book about short cycles continuing during the war. They do.

5. What was said about income distribution and social stability was an aside. It is out of my field of competence. I have nothing to add.

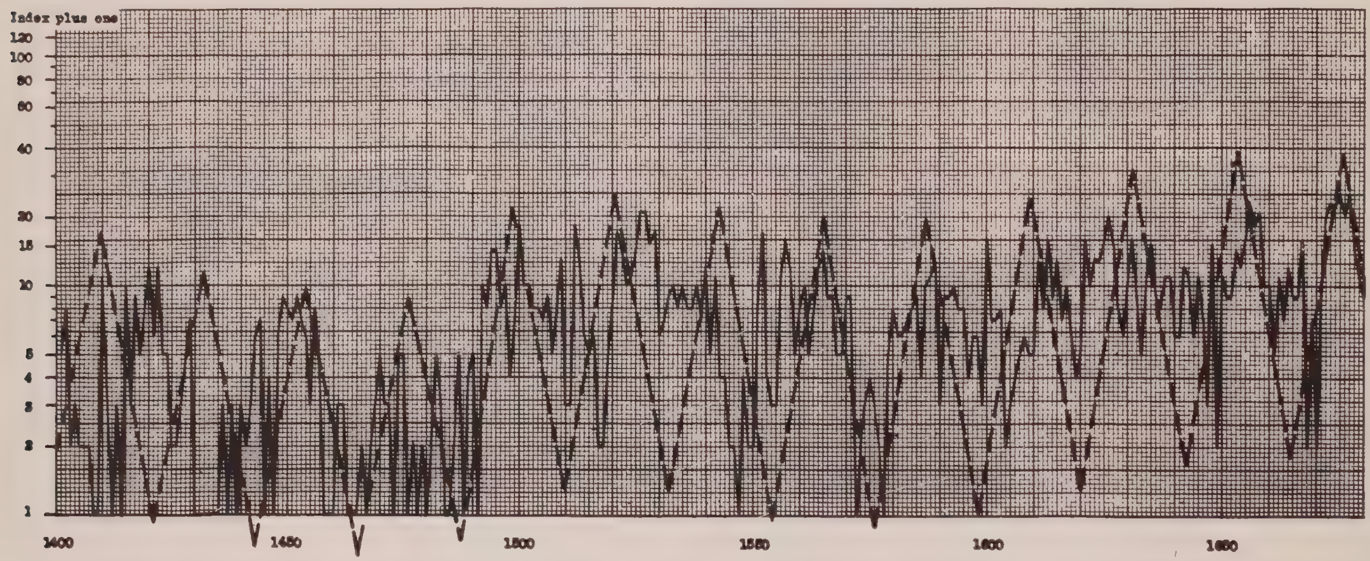


Fig. 1. The number of international battles (plus one), year by year from 1400 through 1943, together with a diagram of the 22 1/7 year cycle. Ratio scale.

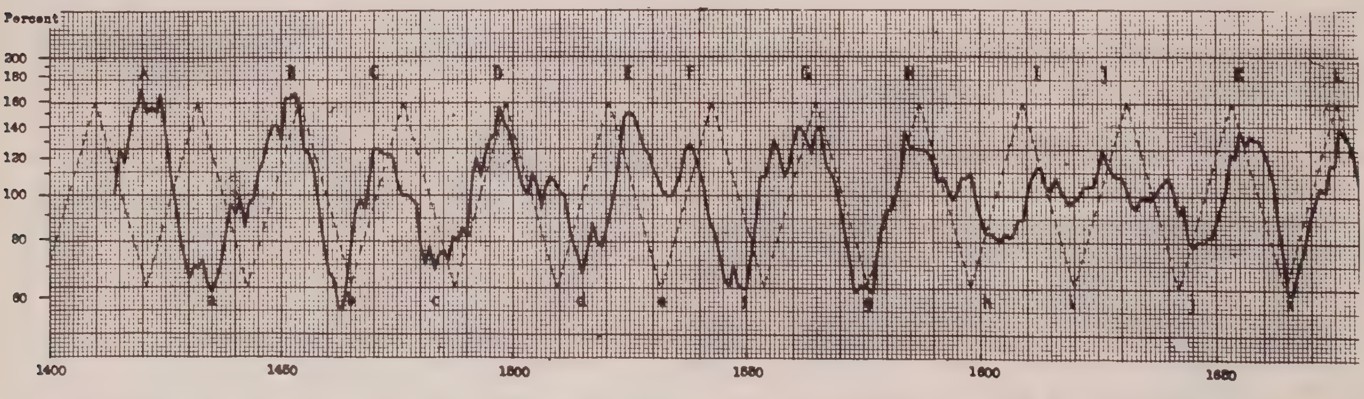


Fig. 1-A. The values shown in Fig. 1, smoothed, together with a diagram of the 22 1/7-year cycle. It is hard to believe that behavior of this degree of regularity could come about by chance.

Repudiation Ahead?

6. The fact that the government debt is increasing at an increasing rate is also a truism when the matter is looked at objectively over a long period of time. Unless this trend is altered, there is but one possible outcome--repudiation.

I sometimes wish that Mr. Dakin and I had been a little more forthright in setting out this ugly fact. However, we thought it self evident. Repudiation will happen if and when the interest burden becomes politically intolerable. Personally I do not look for repudiation until after the next major war.

7. As it turned out, and in spite of what seemed reasonable at the time, post war behavior did not offer a test of cycles after all. *Neither* the traditional post war behavior *nor* the expectations based on our then knowledge of cycles evolved as expected.

* * * * * * *

Cycles in War

Now I would like to review for you the subject of cycles in war. Great advances have been made in our knowledge during the past five years.

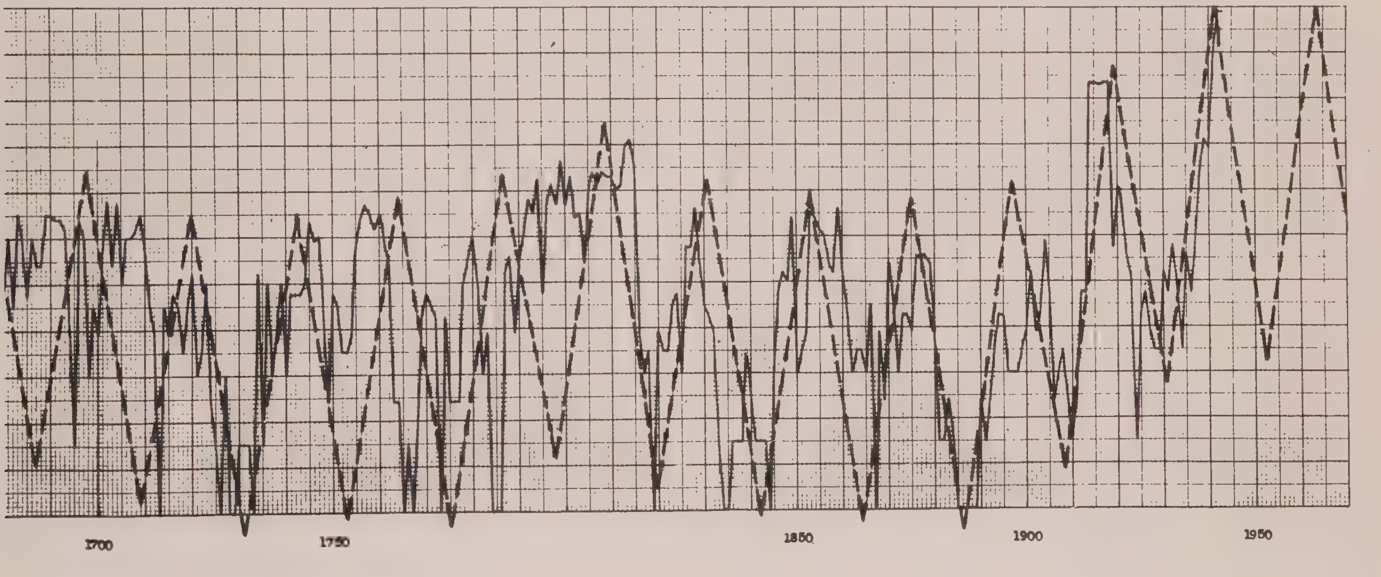


Fig. 1. Continued.

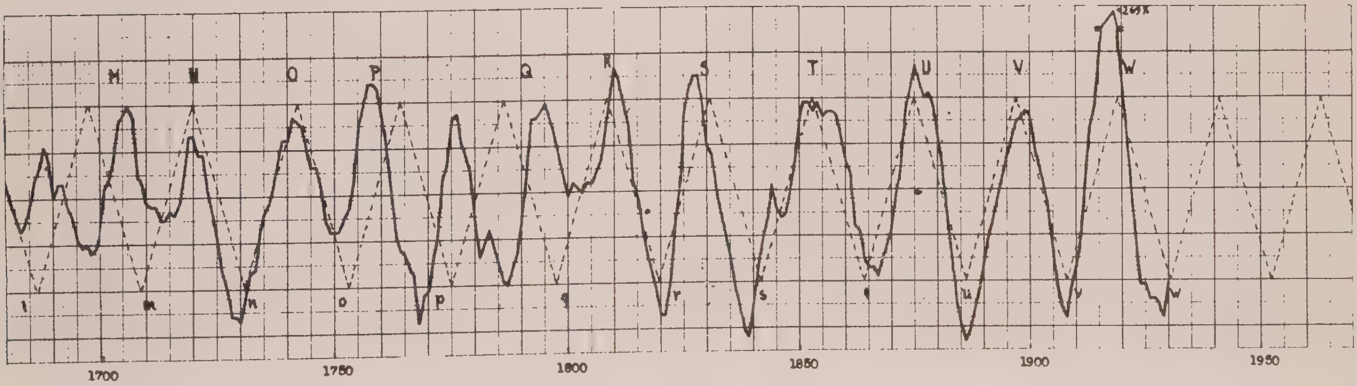


Fig. 1-A. Continued.

Consider Fig. 1 above. It shows you the number of international battles since 1400 A. D. together with a diagram of the 22 1/7-year cycle. Fig. 1-A below it shows you the same values smoothed. It makes it easier to see the cycle. It is hard to believe that behavior of this regularity could come about by chance. These charts are fully described and explained in *Cycles* for February 1951.

Figs. 2 & 3 at the end of this postscript are the same as Fig. 1 & 1-A except (a) they are on enlarged scale, (b) they run only from 1750, (c) they are brought as nearly up to date as published figures permit.

Fig. 4 shows you the 11.2-year cycle in these figures. The 11.2-year cycle in international battles is fully discussed in the April 1953 issue of *Cycles*.

Fig. 5, below, shows you the 142 year cycle in international battles. It is discussed in *Cycles* for June 1952.

Fig. 6, on the first page of this postscript, diagrams all the above cycles in international battles (together with trend and another cycle (57 years long) discussed in *Cycles* for January 1951). It also diagrams their synthesis or combination.

Rough Times Ahead. *E.R.D.*

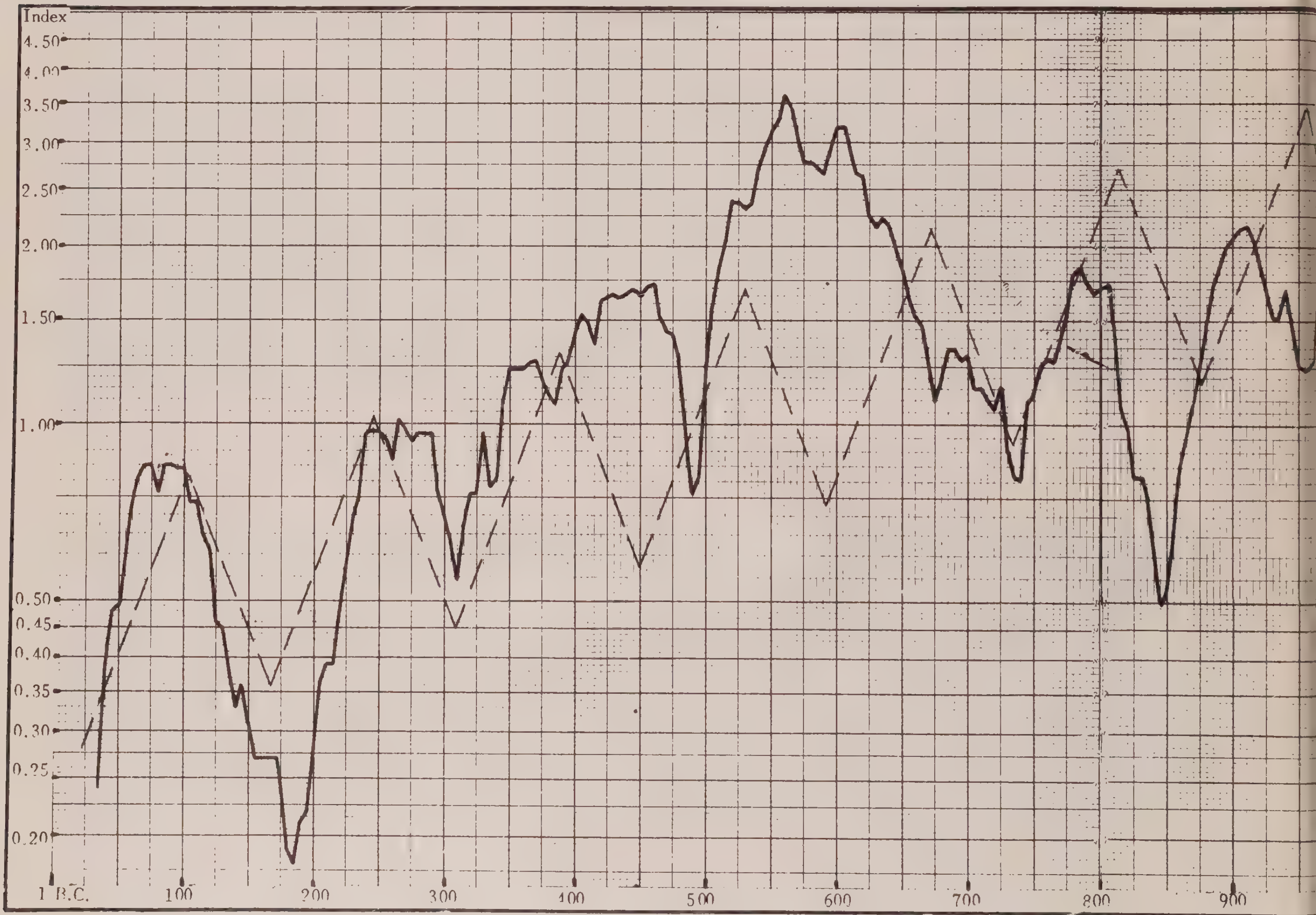
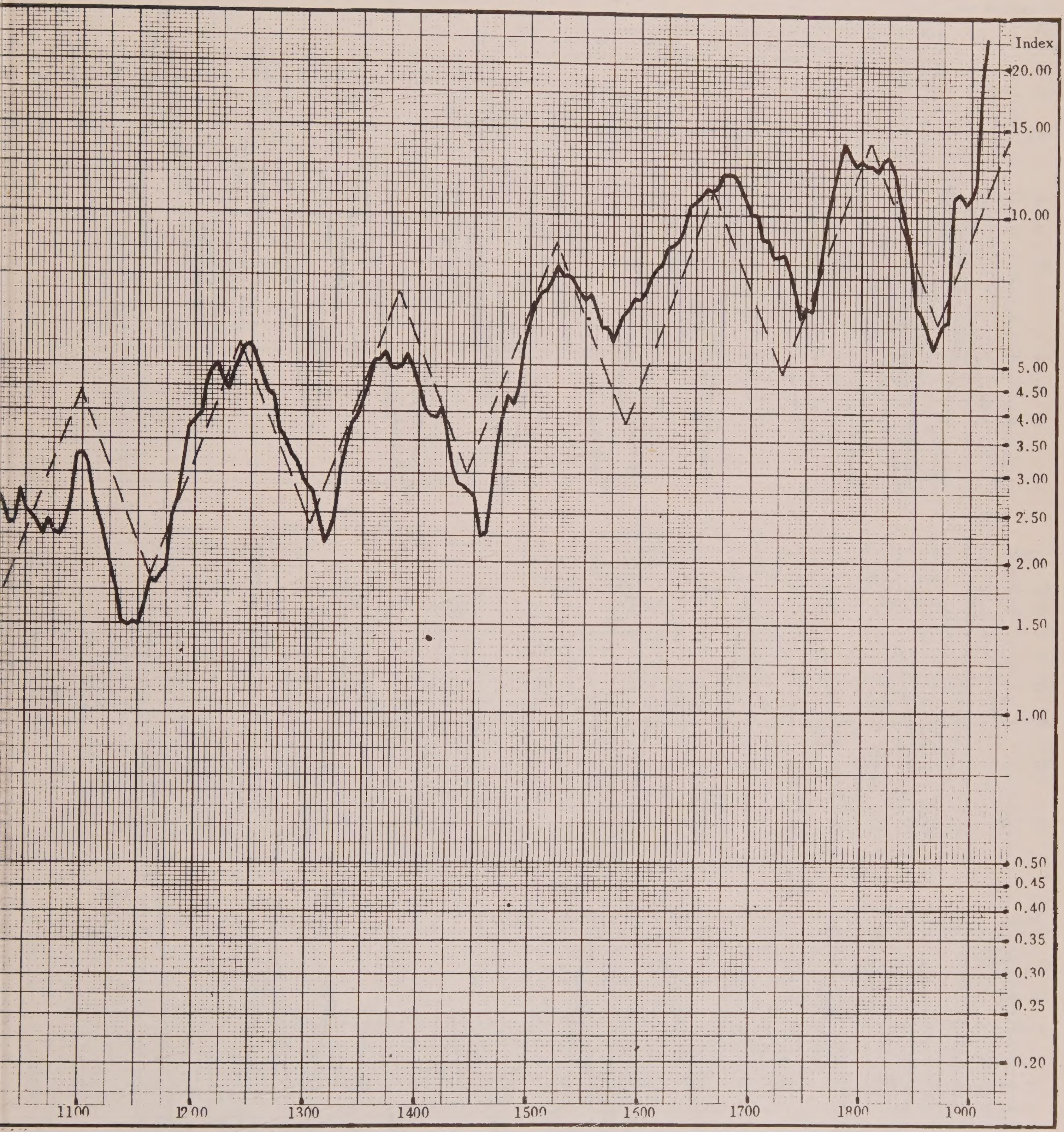


Fig. 5. The chart above shows the 67-year moving average of Professor Raymond H. Wheeler's index of international battles. The values for every fifth year are plotted. Note the continuous upward trend since 1 A.D. and the prevailing cycle of 142 years.

1955 Postscript



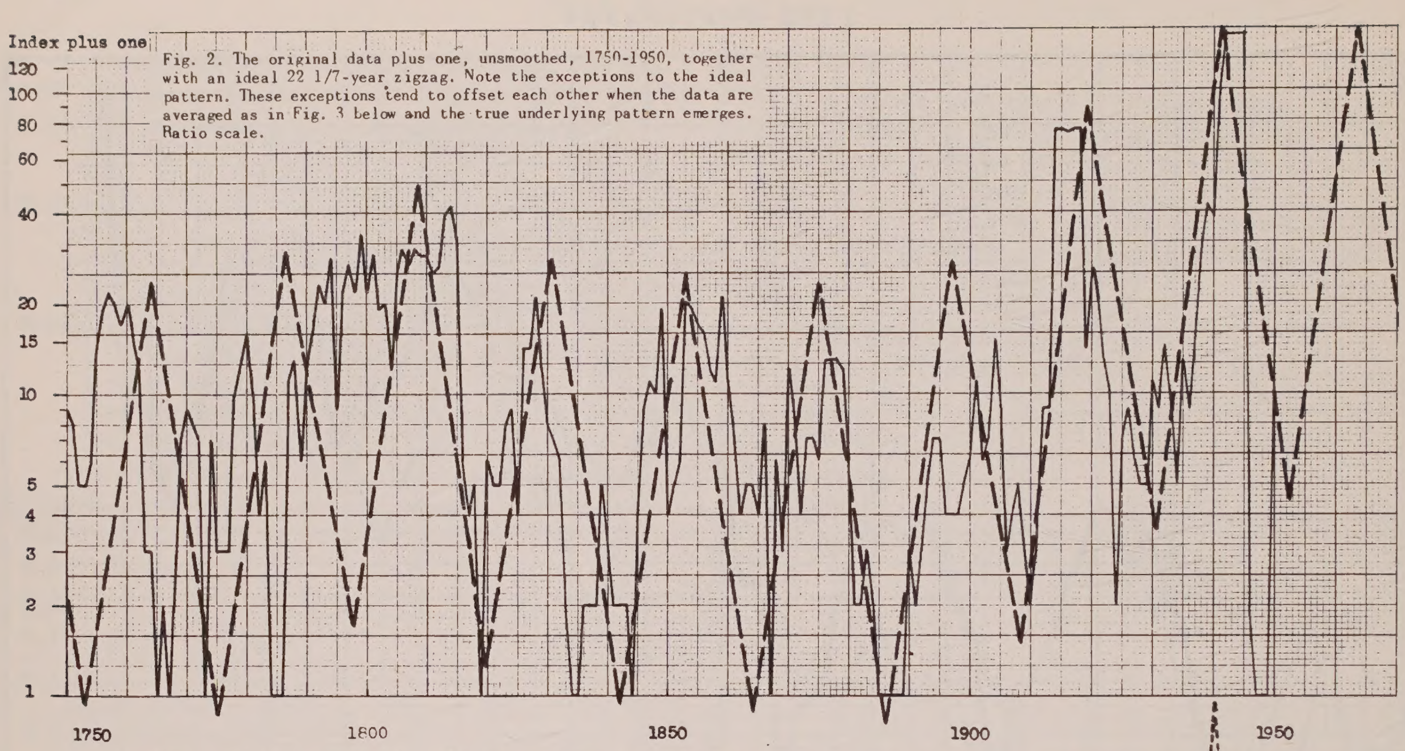


Fig. 2. The original data plus one, unsmoothed, 1750-1950, together with an ideal 22 1/7-year zigzag. Note the exceptions to the ideal pattern. These exceptions tend to offset each other when the data are averaged as in Fig. 3 below and the true underlying pattern emerges. Ratio scale.

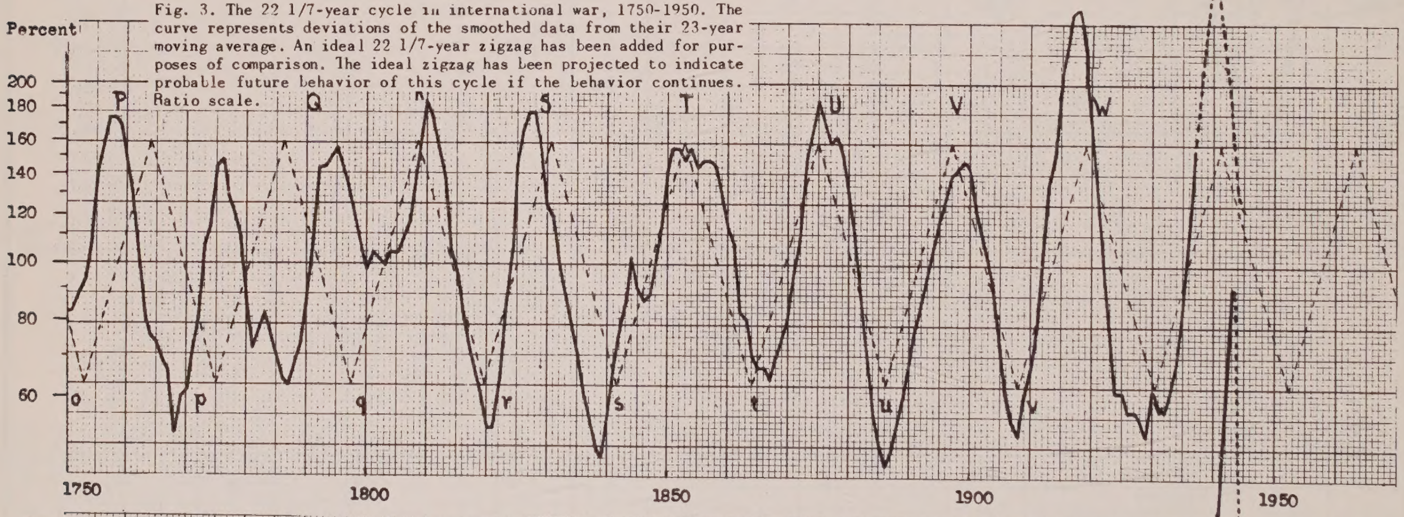


Fig. 3. The 22 1/7-year cycle in international war, 1750-1950. The curve represents deviations of the smoothed data from their 23-year moving average. An ideal 22 1/7-year zigzag has been added for purposes of comparison. The ideal zigzag has been projected to indicate probable future behavior of this cycle if the behavior continues. Ratio scale.

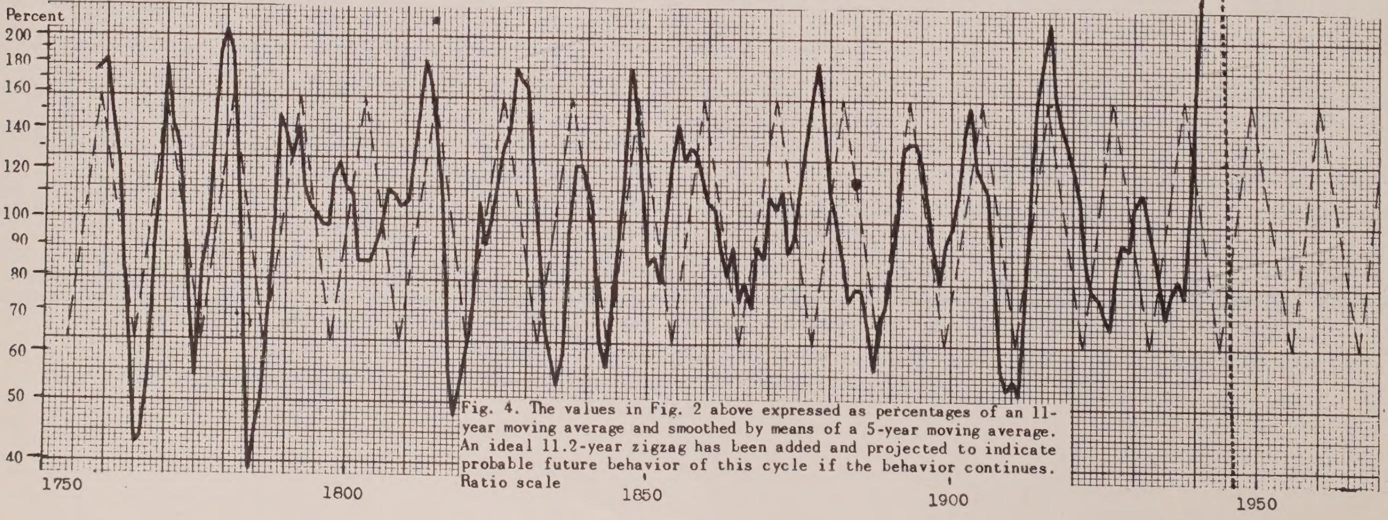


Fig. 4. The values in Fig. 2 above expressed as percentages of an 11-year moving average and smoothed by means of a 5-year moving average. An ideal 11.2-year zigzag has been added and projected to indicate probable future behavior of this cycle if the behavior continues. Ratio scale

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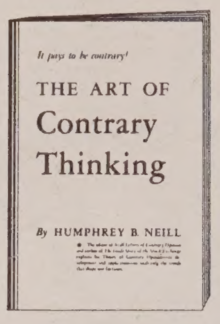

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